SERVICE MANUAL & PARTS LIST

AEU-7000L-70V/7000E-70V
Implant/Endodontic Dental Systems

AEU-7000L-70V System

Aseptico®

TABLE OF CONTENTS

General Service Information 1
Inspection & Operation Verification 1
Cleaning & Lubrication 2
ESD Precautions 2
Disassembly, Top Cover 3
Disassembly, Chassis 5
Reassembly 9
Final Test Verification 10
Motor Field Testing 11
Handpiece Calibration Error Testing 12
Power PCB Testing 13
Power PCB Testing Points 14-16
Electrical Safety Tests 17
Reprogramming System Software 18
Reprogramming System Firmware 19-20
Sterilization Procedure 21
Maintenance & Cleaning 22
Specifications 22
General Troubleshooting. 23
Changing the Fuse 23
AEU-7000L Parts List 24-25
AEU-7000E Parts List 26-27
Symbol Definitions 28
Tools List 28
Warranty 29
Notes 29

To prevent injury to people and damage to property, please heed relevant warnings and remarks. They are marked as follows:

WARNING:	Serious injury or death may result if ignored.
CAUTION:	Damage to property or the environment may result if ignored.
NOTE:	Important additional information and hints.

WARNING - RISK OF ELECTRIC SHOCK

REQUIRED QUALIFICATIONS OF SERVICE TECHNICIANS:
Persons performing repairs to active electronic circuitry or operating High Voltage (e.g. HiPot) test equipment must have training or experience performing similar servicing activities.

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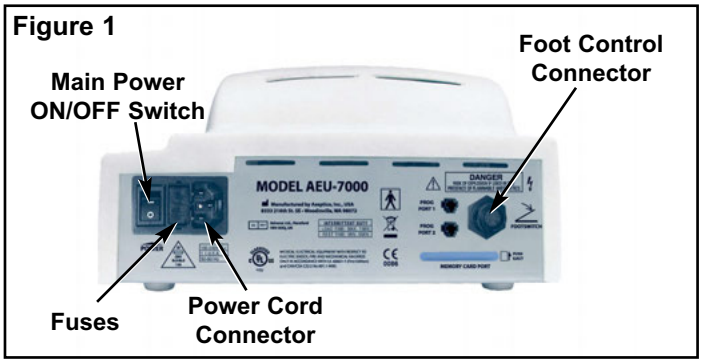
GENERAL SERVICE INFORMATION

This service and parts manual offers technicians information and parts lists not available in the AEU-7000L-70V or AEU-7000E-70V Operation and Maintenance Instruction Manuals. This manual will help you better understand how the dental units work, thereby reducing service time. Parts are listed and referenced to callouts in the Parts Lists, pages 24 & 26. Use the information in the Parts List when ordering replacement parts.

Inspection & Operation Verification

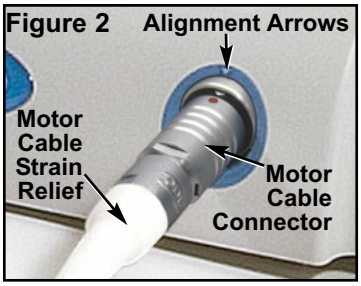
To verify that the 7000L/E units are set up and functioning properly, refer to the set up instructions below and in their respective Operation & Maintenance manuals. First, attach the power cord to the back of the console and plug into a grounded electrical outlet (see Fig. 1). **NOTE:** Both 7000 series units are compatible with 115VAC, 60Hz and 230VAC, 50Hz voltages and frequencies.

Figure 1



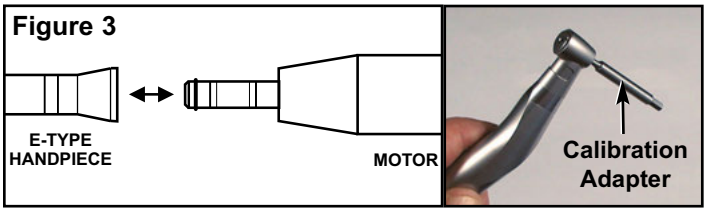
Connect the motor/cable to the receptacle on the lower right front of the console (see Fig. 2). When attaching the cable to unit, align the red dot on cable connector with the arrows located at top center of receptacle and bezel, and gently push the connector straight in to lock into place. Remove cord by pushing inward slightly on the strain relief, then grasping connector body near the red dot and pulling the connector straight out of receptacle.

Figure 2



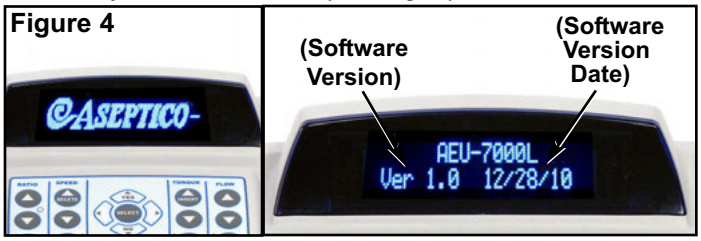
Attach an 'E' Type 20:1 handpiece to the motor, and install the Dynamometer Adapter into the handpiece (see Fig. 3).

Figure 3



Attach the supplied AE-70V2 variable-speed foot control to the connector located on the rear of the unit (see Fig. 1). The AE-23 Irrigation Tubing Set does not need to be installed during routine maintenance and troubleshooting of the console and/or motor. For troubleshooting irrigation problems relative to the pump and/or irrigation tubing, refer to System Troubleshooting on page 20. Turn the power switch on the rear panel of the console to the 'On' (-) position. The vacuum fluorescent display should show the startup screen for a few seconds, then default to the operating parameters of the last-used preset (or preset #1 if the factory setup was recalled). The startup screen will display the Aseptico logo and then the software version onboard your 7000L/E unit (see Fig. 4).

Figure 4

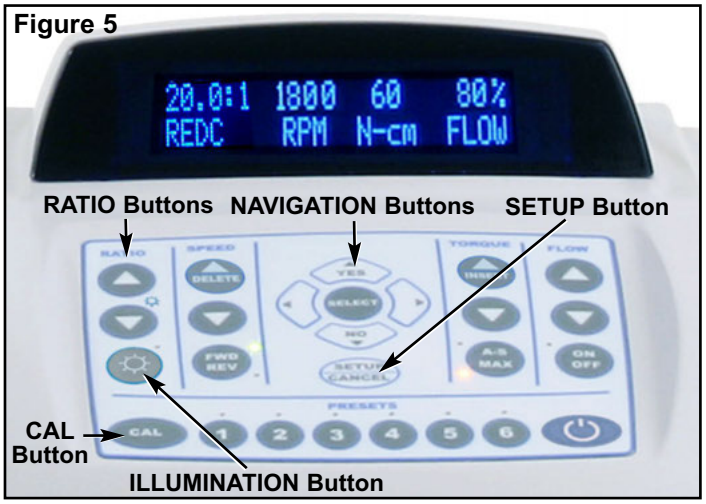


Press the "RATIO" Up or Down buttons to select "20:1" on the display (see Fig. 5). Depress the foot control pedal to verify that the motor and pump operates. Press the "CAL" button to calibrate the 7000L/7000E handpiece/motor. Follow the menu prompts displayed on the screen to run the handpiece through the two-part calibration procedure (*refer to "OPERATION" section in the Operation Manual for complete calibration instructions)*.

Press and hold the "SETUP" button for one second to enter the AEU-7000L/7000E System Setup program (see Fig. 5). Follow the menu prompts on the screen to recall the factory setup, enable warning tones, and select other system options (*refer to "OPERATION/System Setup" section in the Operation Manual for complete setup instructions)*.

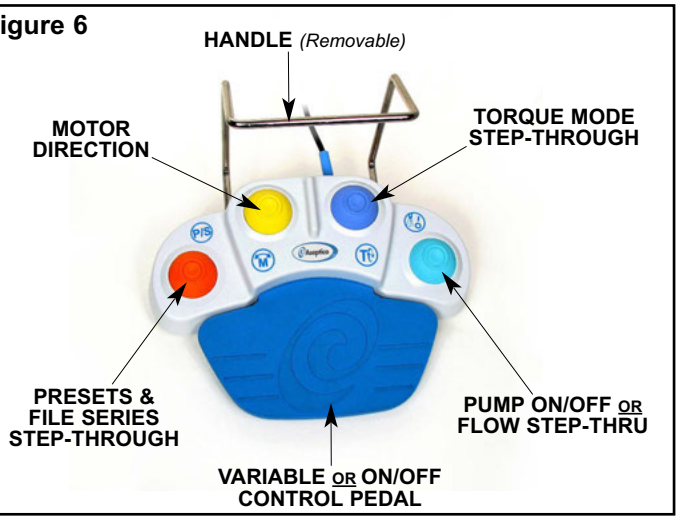
Verify that the "SPEED", "TORQUE", "FLOW", "PRESETS", and key pad navigation buttons are functioning properly (see Fig. 5). Press each button to verify that its displayed values and/or LEDs change accordingly (*refer to "CONTROL PANEL FUNCTIONS" section in the Operation Manual for complete descriptions of all key pad buttons)*. On the AEU-7000L unit only, press the Illumination Button (see Fig. 5) and confirm that the LED on the handpiece illuminates.

Figure 5



Depress each of the buttons on the AE-70V2 foot control to verify that they control motor direction, turn the pump On/Off, and step through the torque settings and presets correctly (see Fig. 6) (*refer to "VARIABLE-SPEED FOOT CONTROL OPERATION" section in the Operation Manual for complete instructions on setting up and operating the foot control).*

Figure 6



The above procedures describe basic inspection and verification of the AEU-7000L/7000E. If the unit performs normally during calibration and setup, and all the key pad buttons function properly, no further testing of the console is needed. If the unit does not perform as required, further diagnosis and service of system components is required. Use the Troubleshooting sections in this manual as a guide to diagnose problems and perform repairs.

Cleaning and Lubrication

When servicing the AEU-7000L/7000E unit, the parts of any component disassembled should be thoroughly cleaned and inspected before reassembly. A mild detergent solution is an effective cleaner on all non-electrical parts. Abrasive cleaners have the potential to damage surface finishes and should be avoided. Any wiping should be done with a soft lint-free cloth.

Electrical parts should be cleaned with an appropriate electrical parts cleaner or air.

Refer to "STERILIZATION & MAINTENANCE" Sections, pages 21 & 22, in this manual for additional cleaning instructions.

ESD PRECAUTIONS

The following electrostatic controls must be used when working on this unit:

ESD Training and Standards:
Employees handling electronic sub-assemblies and ESD sensitive components are expected to be trained. Training should be based on IPC-A-610 or equivalent ESD standard ANSI/ESD-S-20-20 – Protection of Electrical and Electronic Parts, Assemblies and Equipment.

ESD Static Controlled Area:
Areas that are designated for handling and working on electronic sub-assemblies or their components should be marked off with signs indicating the area where ESD controls are to be enforced. These areas are to be kept clear from persons that are not trained to prevent ESD damage from occurring.

ESD Environment:
The work area is to be free of all static generating materials, such as plastic containers, water bottles, plastic bags, plastic objects, such as plastic pens, heat guns (unless made for the ESD environment).

ESD Jackets:
Clothing should be non-static generating (cotton).

Static generating clothing (e.g. wool, acrylic, nylon) must be covered with an ESD jacket that is buttoned closed.

Optional gloves:
Nitrile gloves may be used to cover the hands when working, but are not required.

Seating:
ESD Chairs should be used in place of static generating chairs (e.g. modern office seating use static generating materials).

Storage and packaging:
All circuit boards and components are to be stored on or in static dissipative or static shielding material, throughout shipping and storage.

ESD Wrist Strap and Mat Routine Checks:
The wrist strap should be checked daily using an ESD wrist strap testing station. See chart below.

ESD mats should be checked at least quarterly.

Reading from Operator Through	Maximum Tolerable Resistance	Maximum Acceptable Discharge Time
Wrist strap to ground	100 megohms	Less than 0.1 sec.
Table mat to ground	1000 megaohms	Less than 1 sec.

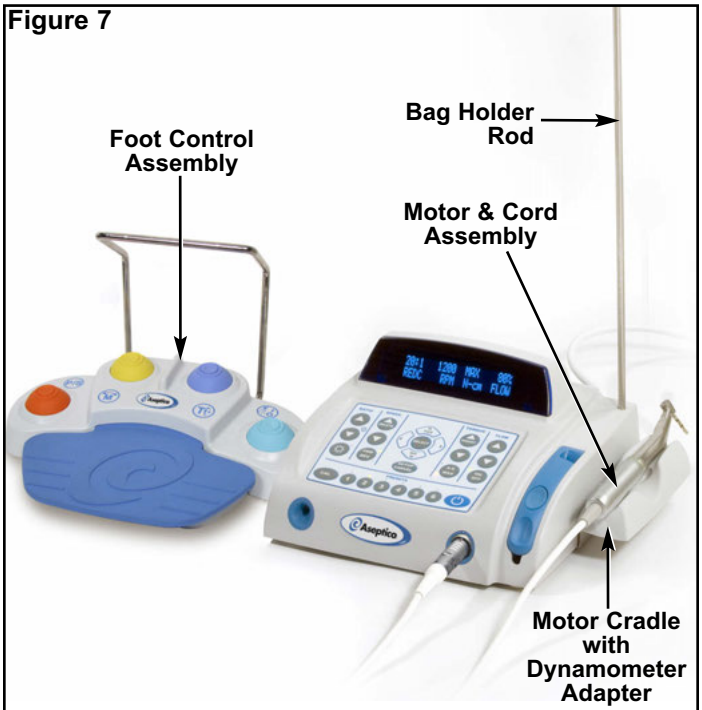
DISASSEMBLY

1. Turn the main power switch OFF. Unplug Power Cord, PNs: 840079 (US) or 840078 (EURO), from AC Inlet Connector. (NOTE: Grasp connector plug at end of Power Cord when removing cord from Unit – do not pull on cable.)

2. Remove irrigation bag and irrigation tubing sets (PNs: AE-23) from Unit. Remove Bag Holder Rod (PN: 461541) from Unit by pulling straight up and out of socket (see Fig. 7). Note alignment of rod pin with keyway in socket.

3. Disconnect Motor/Cord Assembly (PN: AE-230L-40 or AE-230M-40) and Foot Control Assembly (PN: AE-70V2) from Unit (see Fig. 7). **NOTE:** The Motor/Cord Assemblies and Foot Control Assembly can be returned to Aseptico if repair services are necessary -- consult Aseptico Repair Department for more information.

Figure 7

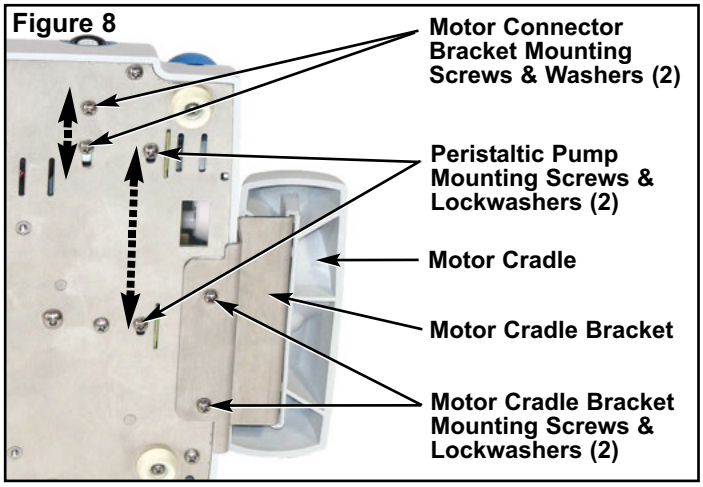


TOP COVER DISASSEMBLY:

4. Remove Motor Cradle (PN: 461561) and Dynanometer Adapter (PN: 461558) (see Fig. 7). Turn Unit over and gently lay face down onto padded surface to prevent scuffing.

5. Using a #2 Phillips screwdriver, remove two screws (PN: 510406) and lock washers (PN: 510419) that attach Motor Cradle Bracket to Chassis (see Fig. 8). Remove Bracket and set aside for reassembly later.

Figure 8


Motor Connector Bracket Mounting Screws & Washers (2)
Peristaltic Pump Mounting Screws & Lockwashers (2)
Motor Cradle
Motor Cradle Bracket
Motor Cradle Bracket Mounting Screws & Lockwashers (2)

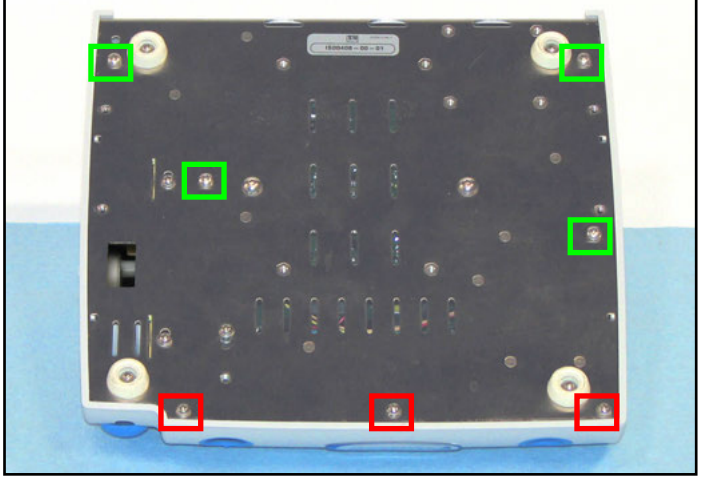
6. Locate two screws (PN: 510406) and lock washers (PN: 510419) that attach Motor Connector Bracket to Chassis (see Fig. 8). Remove only the front screw and washer with a #2 Phillips screwdriver. Loosen, but do not remove, second screw and washer located in slotted hole.

7. Slide Motor Connector (PN: 875073) and Bracket backwards in slotted hole so that Connector disengages from blue bezel in cover. Lightly tighten mounting screw to secure Connector/Bracket in place.

8. Locate two screws (PN: 510406) and lock washers (PN: 510419) that mount Peristaltic Pump Assembly (PN: 330471) to Chassis (see Fig. 8). Using a #2 Phillips screwdriver, loosen but do not remove, both screws and lock washers. Slide Pump Assembly forward in slotted mounting holes provided.

9. Using a #2 Phillips screwdriver, remove three short screws (PN: 510406) and lock washers (PN: 510419) located along forward edge of Unit (see Fig. 9). Remove four longer screws (PN: 510643) and lock washers (PN: 510419) that attach Top Cover subassembly to Chassis.

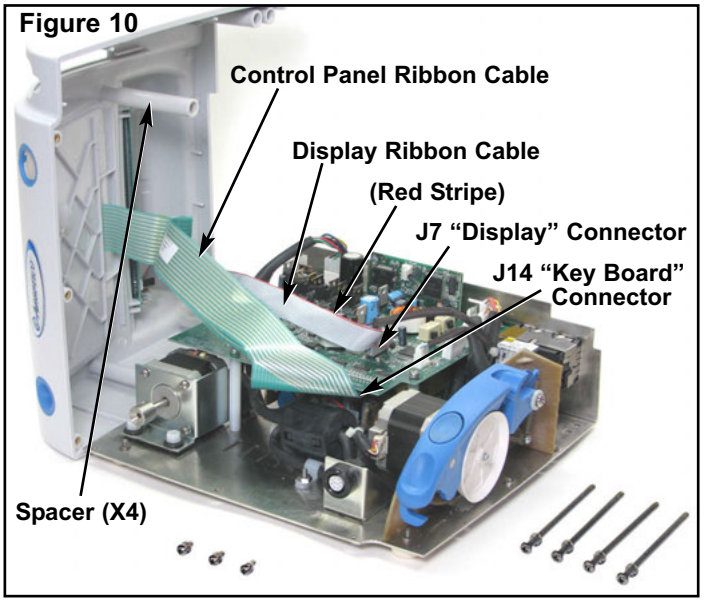
Figure 9 = Short Mtg. Screws = Long Mtg. Screws



DISASSEMBLY - *Cont'd*

10. Turn Unit over and position upright on workbench. Carefully work Top Cover subassembly off Chassis. (**NOTE:** To help clear the Cover past the Pump door, follow these steps: a) Slide Pump forward in slotted mounting holes; b) Carefully lift Cover straight upwards, until it disengages from Chassis base; c) Push Pump door release button and hold Door ajar approximately 1/4 inch - do not allow door to fully open; d) With door ajar, manipulate Cover up and over the rear edge of door; e) Allow Door to fully open; then, f) Lift Cover up and off Chassis.) Rest Top Cover on its side, next to Chassis as shown in Figure 10, taking care not to kink or sharply twist the flex cables from Cover's Control Panel and Display.

Figure 10



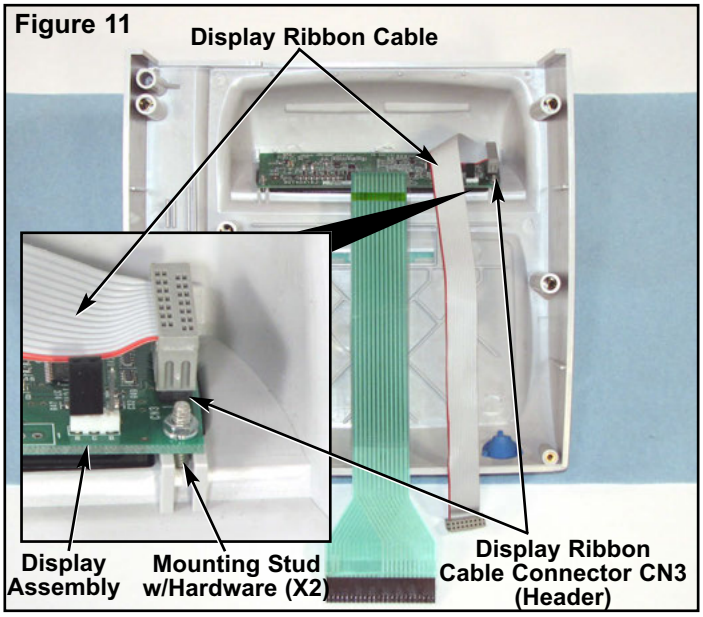
11. Note orientation of red stripe on Display Ribbon Cable (PN: 870300) with Pin #1 on "Display" connector 'J7', located on PCB Assembly (see Fig. 10). Detach Ribbon Cable from connector 'J7'.

12. Note orientation of Control Panel flex cable with "Key Board" connector 'J14' on PCB Assembly (see Fig. 10). Detach flex cable from connector 'J14'.

13. Turn Top Cover subassembly over and lay face down on protective pad. Remove four spacers (PN: 461560) from Cover if necessary (see Fig. 10). Note orientation of red stripe on Display Ribbon Cable with connector 'CN3' on Display PCB (see Fig. 11). Detach Display Ribbon Cable and set aside for reuse later.

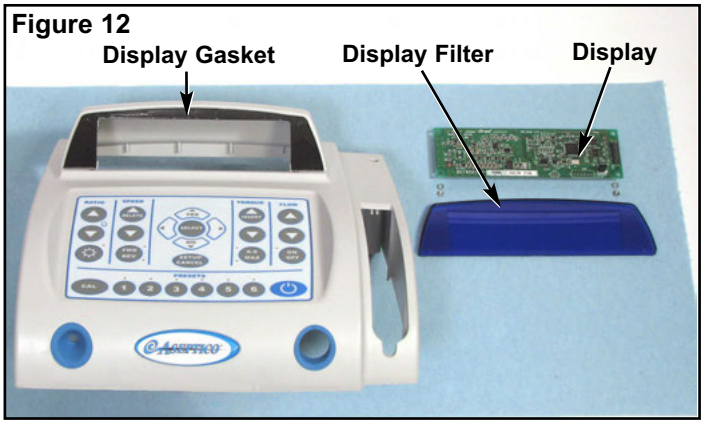
14. Use a 3/16" wrench to remove two mounting nuts (PN: 510005) and split washers (PN: 510004) from Vacuum Fluorescent Display Assembly (PN: 330503) (see Fig. 11). Carefully lift Display Assembly off the two studs (PN: 510625) and place Assembly aside for reuse later. (**NOTE:** The Display Assembly is a non service-able component of the AEU-7000 System. If not functioning properly, either replace Display with a new Assembly or return Display to Aseptico for repairs. When installing a new Assembly, ensure that Display header is properly oriented to Cover cutout. The header should be positioned on right side of cutout when viewing the inverted Cover from the front.)

Figure 11



15. The Display Gasket (PN: 461549), which is mounted under the Display Filter (PN: 461548), uses double-sided adhesive backing to adhere the Filter to the Top Cover (see Fig 12). Remove Display Filter from Cover by pushing outwards on Filter from inside the Cover. Push firmly with fingers until Filter pops out (take care not to scratch Filter). Place Filter aside for reassembly later. Peel old Gasket from face of Display housing and discard. (**NOTE:** A new Gasket must be installed each time the Filter is removed from Cover - **do not reuse an old Gasket**.) To reassemble Filter and new Gasket, remove liner from back side of Gasket and carefully apply Gasket to housing face, aligning its outer periphery to the raised edge on housing face (see Fig. 12). Then, remove the other liner from the front side of Gasket and press Display Filter onto Gasket. (**NOTE:** Ensure that the inside face of Filter is clean and free of dust before applying to adhesive.)

Figure 12



16. The Control Panel Overlay Assembly (7000L PN: 420860; 7000E PN: 420584) is attached to Top Cover with an adhesive backing (see Fig. 13a). Removal of the Overlay is not recommend-ed unless absolutely necessary. If removal is required, carefully peel the Overlay out of recess in Cover and permanently discard entire Overlay Assembly. (**NOTE: Do not reuse an old Overlay Assembly** - a detached Overlay should always be replaced with a brand new Assembly.) To reinstall new Overlay: 1) Insert flex cable pigtail through the slotted hole in the Top Cover; 2) Remove liner from adhesive backing on new Assembly; 3) Carefully center new Assembly in recess in Top Cover; and, 4) Press down evenly on Assembly until firmly adhered to Cover. On the underside of the Cover, tape a loop in the Control Panel Flex Cable (do not crease) using 2.0" of Kapton Tape (PN: 490088). See Fig. 13b.

Figure 13a

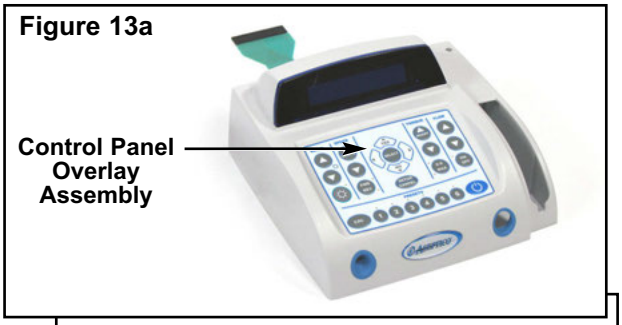
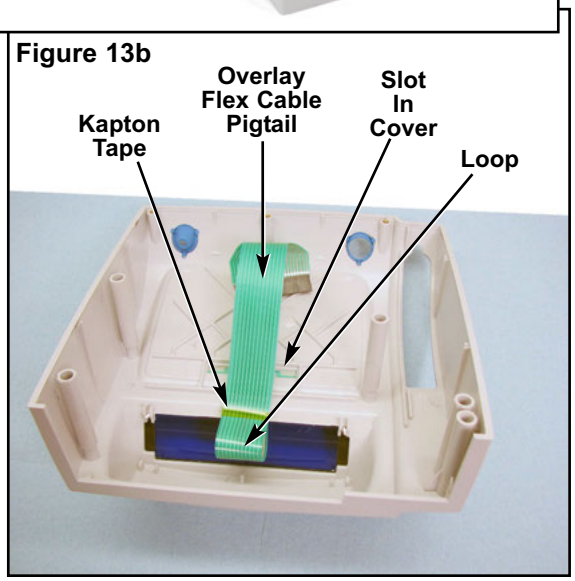
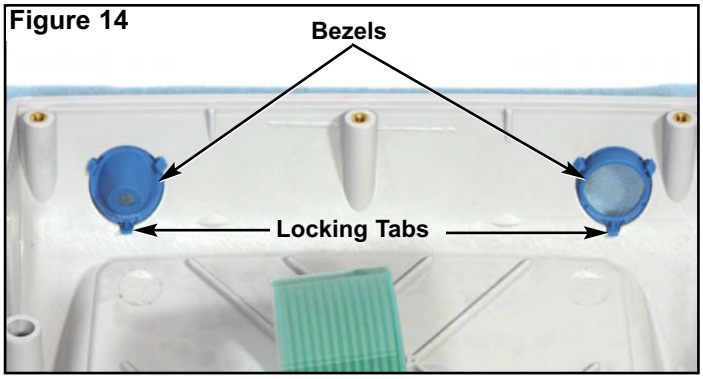


Figure 13b



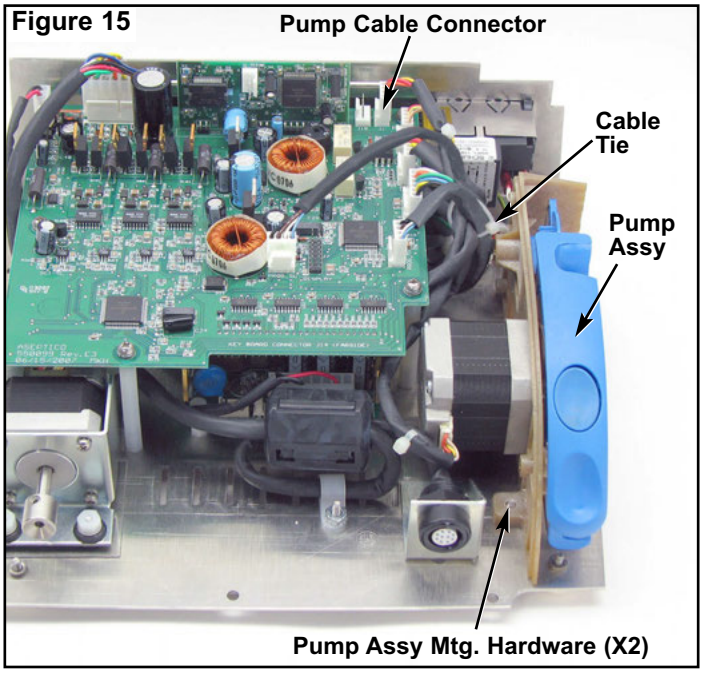
17. From the inboard side of Cover, use fingers (or pliers) to pinch together the locking tabs of Dynamometer Bezel (PN: 461538) and Motor Connector Bezel (PN: 461545) (see Fig. 14). Push each Bezel outward through its respective hole in Cover. Set Bezels aside for reuse later. (**NOTE:** When remounting Bezels, ensure that locking tabs fully snap over edges of holes, into grooves provided on inside of Cover.)

Figure 14



18. Cut and remove the cable tie surrounding the cable bundle on right-hand side of PCB Assembly (see Fig. 15). Detach Pump Assembly cable connector at 'J1' ("Pump") location on PCB Assembly. Make note of pin/wire alignments of connectors before disconnect-ing from PCB. Use a #2 Phillips screwdriver to remove two Pump Assembly mounting screws (PN: 510406) and lock washers (PN: 510419) from bottom of Chassis (see Fig. 8). Remove Pump Assembly (PN: 330471). Remove the two Isolation Pads (PN: 461995) underneath the Pump. (**NOTE:** The Pump Assembly is a non-serviceable component of AEU-7000L/7000E System. If not functioning properly, either replace with new Assembly or return Pump to Aseptico for repairs.)

Figure 15



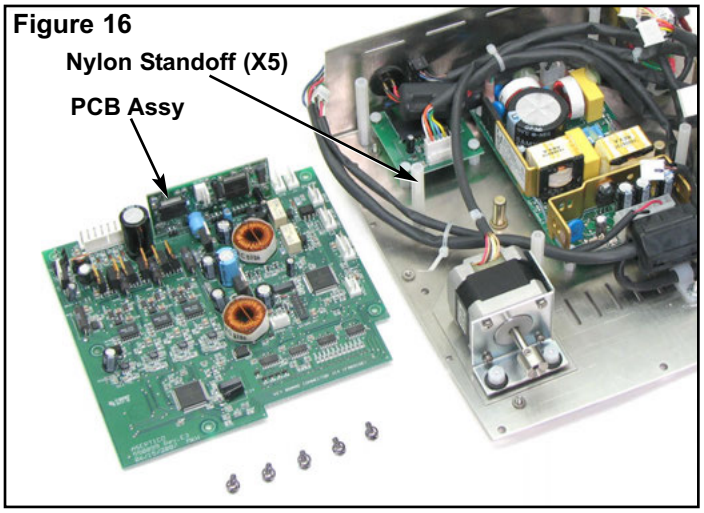
CHASSIS DISASSEMBLY:

19. Disconnect all cable and wire connectors from PCB Assembly (7000L PN: 330575/7000E PN: 330514). Make note of each cable's routing and connector/pin orientation before disconnecting from PCB (see Fig. 15). Cut and remove cable ties as necessary. Use a

DISASSEMBLY - *Cont'd*

#2 Phillips screwdriver to remove the five screws (PN: 510406), lock washers (PN: 510010), and flat washers (PN: 510587) that attach PCB Assembly to the nylon standoffs on Chassis. Remove PCB Assembly and set aside for reuse later (see Fig 16) (**NOTE:** The PCB Assembly is a non-serviceable component of the AEU-7000L/7000E System. If not functioning properly, replace with a new Assembly.) Use a ¼" wrench to remove the five nylon standoffs (PN: 510626) from Chassis. When reassembling the PCB Assembly, pull motor wires and 48V DC wires forward and secure them to the Chassis standoff with a tie wrap so that the single wires cannot touch the back of the Chassis.

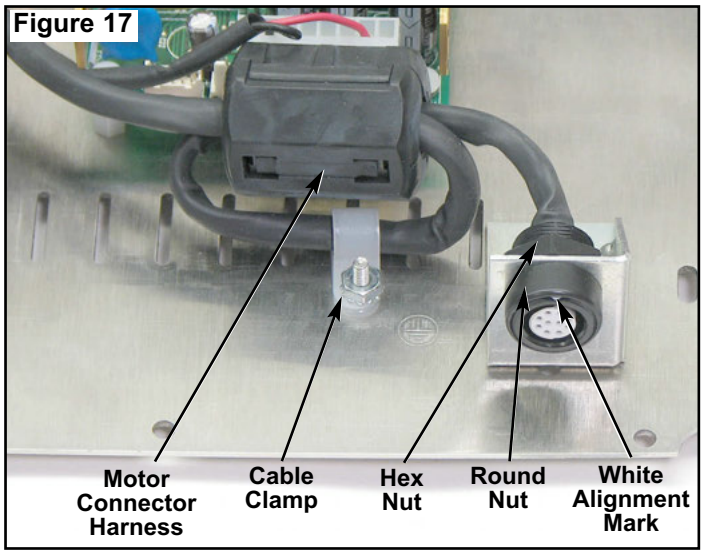
Figure 16



20. Locate Cable Clamp (PN: 510410) on Chassis adjacent to Motor Connector (see Fig. 17). Use a 5/16" wrench to remove kep nut (PN: 510006). Remove Clamp.

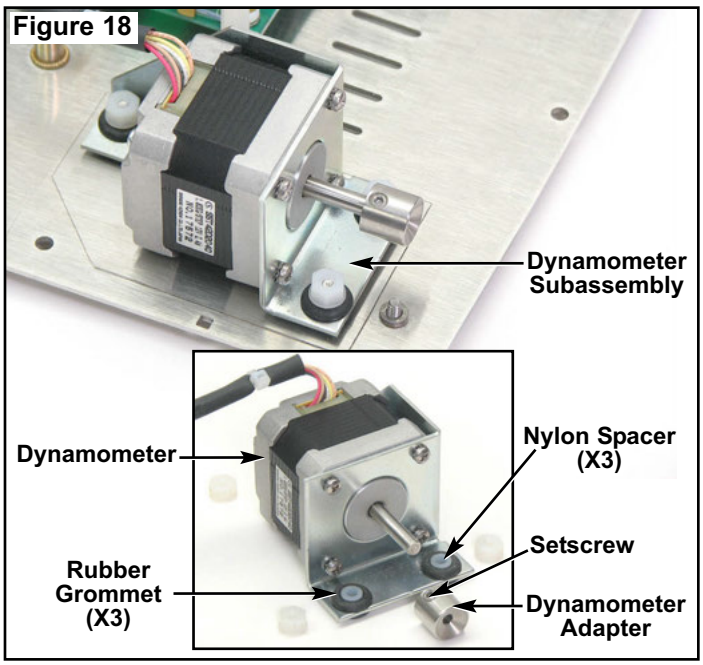
21. Remove screws (PN: 510406) and lock washers (PN: 510419) from slotted holes in bottom of Chassis that connect Motor Connector subassembly to Chassis (see Fig. 8). Use a ¾" open-ended wrench to loosen hex nut (PN: 461970) on the inboard side of Motor Connector Bracket (PN: 461546), which attaches Motor Harness Assembly to Bracket (see Fig. 17). Remove round connector nut (PN: 461969) from outboard side of Bracket. Remove Motor Harness Assembly (PN: 461546) from Bracket. Set Motor Harness and Connector Bracket aside for reassembly later. (**NOTE:** When reassembling Motor Connector subassembly, insert Motor Connector from inboard side of Bracket, outwards through Bracket cutout. Align the flats on Connector barrel with flats on cutout and ensure white alignment mark on Connector is positioned at the top. Apply a drop of white glue (PN: 490142) to the Connector threads before installing round and hex nuts. From outboard side of Bracket, thread round nut up the barrel of Connector by hand until the white alignment mark becomes visible, with approximately one thread showing on face of Connector. Tighten hex nut on the other side of the Bracket to snug Harness Assembly up against Bracket.)

Figure 17



22. Use a 5/16" wrench to remove three nylon nuts (PN: 510745) and rubber grommets (PN: 870185) that attach Dynamometer subassembly to Chassis (see Fig. 18). Remove subassembly. Remove three nylon spacers (PN: 510163) and Insulator (PN: 461979) from underneath subassembly. Use a 5/64" Allen wrench to loosen setscrew (PN: 510278) that secures the Dynamometer Adapter (PN: 461540) to Dynamometer shaft. Remove Adapter and set aside for reassembly later. (**NOTE:** When reassembling Adapter onto Dynamometer shaft, apply a drop of Threadlocker (PN: 490053) to setscrew, then torque the setscrew to 8-10 in.lb.) Use a #1 Phillips screwdriver to remove four screws (PN: 510627) that attach the Dynamometer to the Dynamometer Bracket (PN: 461551). Remove Dynamometer from Bracket. (**NOTE:** The Dynamometer is a non-serviceable

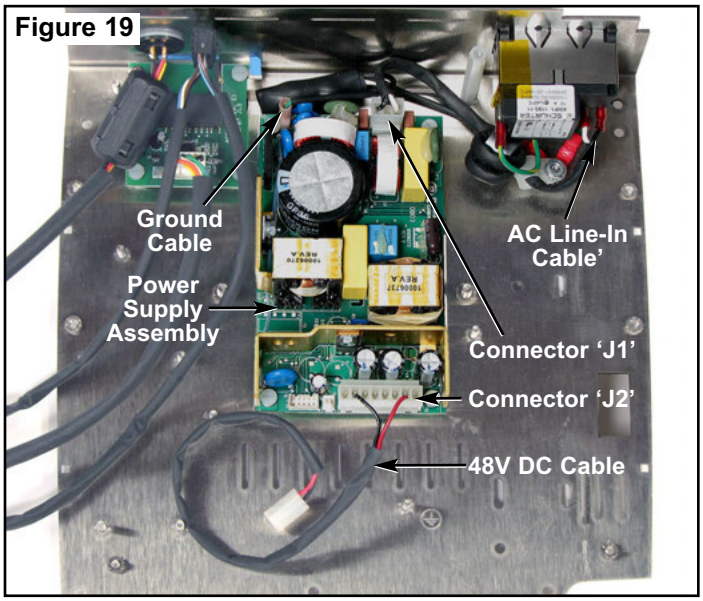
Figure 18



component of the AEU-7000L/7000E System. If not functioning properly, either replace with a new Assembly or return it to Aseptico for repair.)

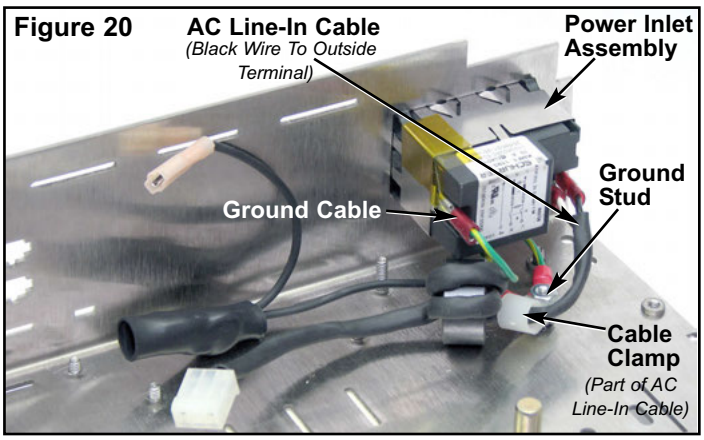
23. On the 48VDC Power Supply Assembly (PN: 840113), detach AC Line-In Cable Assembly (PN: 875077) from connector 'J1', and 48V DC Cable Assembly (PN: 875076) from connector 'J2' (see Fig. 19). Make note of pin/wire orientation before disconnecting Cables. Use a #2 Phillips screwdriver to remove four screws (PN: 510746), lock washers (PN: 510010), and flat washers (PN: 510587) that attach Power Supply to Chassis. Remove Power Supply and set aside for reuse later. Remove Standoffs (PN: 510747). (**NOTE:** The Power Supply Assembly is a non-serviceable component of AEU-7000L/7000E System. If not functioning properly, replace with new Assembly.)

Figure 19



24. Locate ground stud adjacent to Power Inlet Assembly (see Fig. 20). Use a 5/16" wrench to remove two kep nuts (PN: 510006) and external star washers (PN: 510007) that attach Cable Clamp (part of the AC Line In Cable) and Ground Cable Assemblies (PNs: 875075 and 875112) to stud. Detach AC Line-In Cable (PN: 875077) and Ground Cable wire connectors from

Figure 20



spade terminals on Power Inlet Assembly (PN: 840086). Make note of wire/terminal orientation before removing Cables. (**NOTE:** During reassembly, ensure that the black wire of AC Line-In Cable is attached to the outside terminal on Power Inlet Assembly.)

Figure 21a

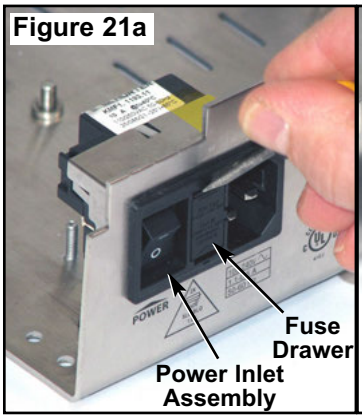
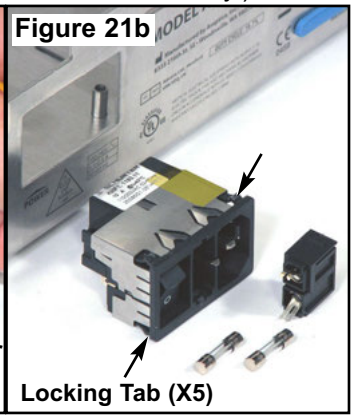
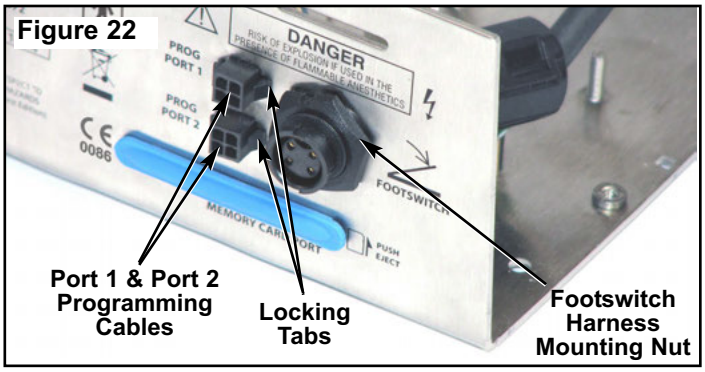


Figure 21b



25. Use a small screwdriver to detach and remove Fuse Drawer (PN: 840060) from Power Inlet Assembly (see Fig. 21a). Remove two Fuses (PN: 830040) from Fuse Drawer if necessary. Press in the five locking tabs on inboard side of Power Inlet Assembly (PN: 840086) and push Assembly outward through cutout in back panel of Chassis (see Fig. 21b). Set Assembly aside for reuse later.

Figure 22



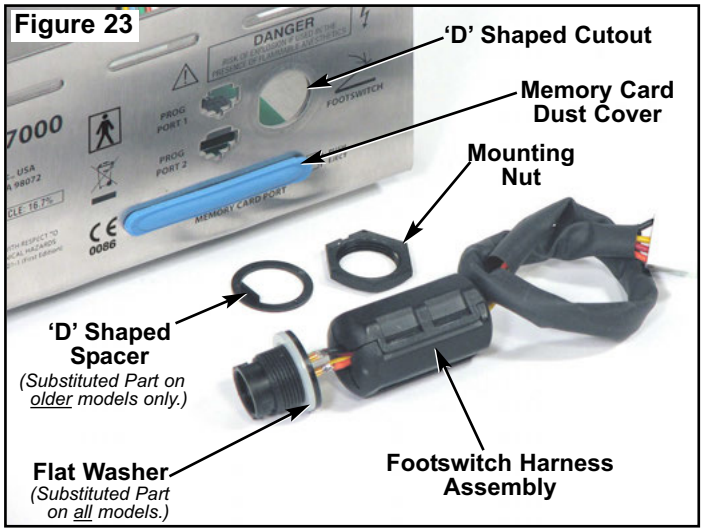
26. On outboard side of Chassis back panel, use pliers to pinch together the two locking tabs on the sides of the two Programming Cables (PN: 875057-01) (see Fig. 22). Push cable connectors inward through port cutouts in Chassis, noting alignment of keyway on bottom of connectors. Remove Cables and set aside for reuse later.

27. Use a 13/16" wrench to remove mounting nut on outboard side of Footswitch Harness Assembly, PN: 875074 (see Fig. 22). (**NOTE:** Take care to protect the back panel against scratches when removing nut.) Remove plastic 'D' shaped spacer, PN: 461692 (**NOTE:** 'D' shaped spacer is used on older model units only). Push Harness Assembly inward through 'D' shaped cutout in Chassis. Note top center position of keyway on threaded connector. Remove Harness Assembly and set aside for reuse later. (**NOTE:** If

DISASSEMBLY - *Cont'd*

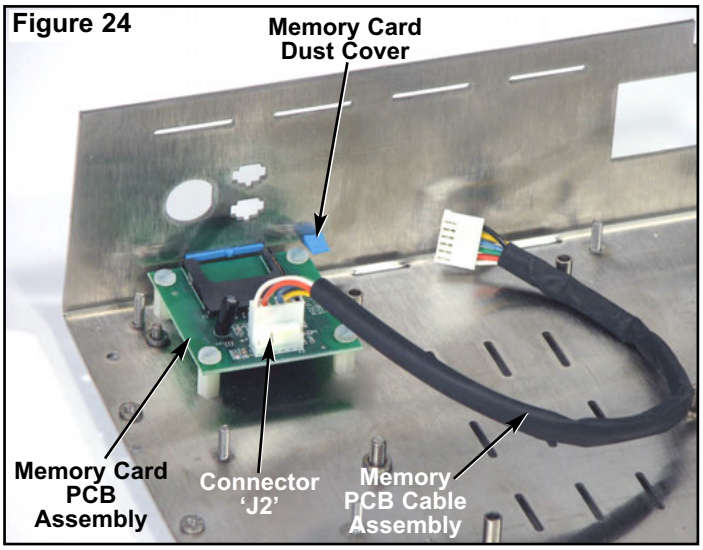
installing a new Footswitch Harness Assembly, and the rubber gasket that is supplied with new Harness Assembly is lost, Flat Washer [PN: 510648] may be substituted. On older model units only, replace rubber gasket with Flat Washer and 'D' shaped Spacer [PN: 461692]. See Fig. 23. When attaching the new Harness to the Chassis, mount Flat Washer on inboard side of Chassis and the 'D' Spacer [older models only] on outboard side. Align tab on 'D' Spacer with the flat side of cutout.) Apply a drop of white glue (PN: 490142) to the connector threads before installing nut.

Figure 23



28. Detach Memory PCB Cable Assembly (PN: 875078) from connector 'J2" on Memory Card PCB Assembly (PN: 330507) (see Fig. 24). Make note of pin/wire orientation before disconnecting. Set Cable Assembly aside for reuse later. Use a #2 Phillips screwdriver to remove four screws (PN: 510746), lock washers (PN: 510010), and flat washers (PN: 510587) that attach the Memory Card PCB Assembly to Chassis. Remove Memory Card PCB Assembly and set aside for reuse later. Remove four Standoffs (PN: 510747). (**NOTE:** The Memory Card PCB Assembly is a non-serviceable component of AEU-7000L/7000E System. If not functioning properly, either replace with new Assembly or return PCB to Aseptico for repairs.)

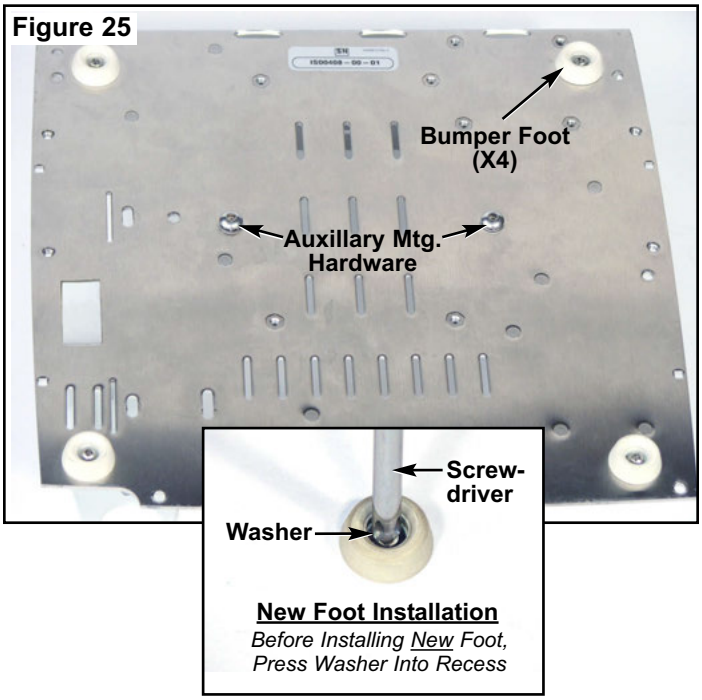
Figure 24



29. Remove Memory Card Dust Cover (PN: 461606) from back panel of Chassis (see Fig. 23), if necessary.

30. Turn Chassis (PN: 461955-08) over to expose four rubber Bumper Feet (PN: 850066) on bottom side (see Fig. 25). Use a #2 Phillips screwdriver to remove four mounting screws (PN: 510406) and washers (PN: 510431) that attach Feet to Chassis bottom. (**NOTE:** If installing new Feet, first use a #2 Phillips screwdriver to press washers [PN: 510431] into recess in rubber Feet [see Fig. 25 inset]. Apply a drop of Threadlocker (PN: 490053) onto threads of screws before mounting Feet onto Chassis.)

Figure 25



31. If necessary, use a 1/8" Allen wrench to remove two auxillary mounting screws (PN: 510312) and washers (PN: 510421) from bottom of Chassis (see Fig. 25).

THIS COMPLETES THE DISASSEMBLY OF THE AEU-7000L/7000E SYSTEM.

REASSEMBLY

32. To reassemble the System, perform steps 1-31 above in the reverse order.

NOTE: Follow these recommended Steps to reassemble the Top Cover to the Chassis:

- **a.** Prior to attaching Top Cover, loosen the two Peristaltic Pump Assembly mounting screws.
- **b.** Loosen only the rear mounting screw on the Motor Connector bracket, then remove the front mounting screw. Slide the Motor Connector backwards in the mounting slot and lightly secure it with the rear screw.
- **c.** Carefully work the Top Cover down over the Chassis and position in place but do not attach to Chassis bottom. Ensure the flex cable from the Control Panel is not sharply bent. Partially open the pump door to allow the Top Cover to work past the rear of the pump door. Work the Top Cover all the way down until it's properly seated against the Chassis bottom. (Note the four plastic alignment tabs that engage the four square holes on the Chassis bottom.)
- **d.** Use a #2 Phillips screwdriver to install three 3/8" screws (PN 510406) with three lock washers (PN 510419), and four longer 2½" screws (PN 510643) and lock washers (PN: 510419), through the Chassis bottom into the Top Cover, as shown on Figure 8, page 3.
- **f.** Reposition the Peristaltic Pump frontwards or backwards until it just clears the Cover at the front when opened. Tighten the two Pump mounting screws.
- **g.** Slide the Motor Connector forward until it protrudes out through the blue bezel in the front of the Unit. Reinstall the front 3/8" mounting screw (PN 510406) with lock washer (PN 510419) and tighten both mounting screws.
- **h.** Open and close the Pump door several times and verify that the door opens, closes, and latches smoothly. Readjust Pump position if necessary.
- **i.** Connect Foot Pedal and Motor. Insert a length of Pump tubing into the peristaltic pump (refer to Operator's Manual for instructions on setting up Pump/tubing). Verify that the Pump latches securely.
- **j.** Power AEU-7000L/7000E Unit 'On'.
- **k.** With the "Flow" 'On/Off' button set to 'On' and the Pump flow rate set to 100%, depress the Foot Control and verify the Pump runs.

FINAL TEST VERIFICATION

1. Verify fuse values. Fuses should be 1.6A 250V SLO-BLO (830040).
2. Check the console for physical imperfections. Verify that the Foot Switch and Motor connectors are tight by connecting the relevant cable and attempting to twist the connector to the left and right by hand.
3. Perform Electrical Safety Tests: **Refer to page 17 for complete instructions on performing the Electrical Safety Tests on the AEU-7000L and AEU-7000E units.**
4. Connect field programmer AFP-01 to Programming Port 1 at the rear of the console. Insert memory card containing Master Code Firmware PN 890048 (7000L) or PN 890022 (7000E) into the AFP-01. Turn on the AFP-01 and wait for the programming process to complete. (**Refer to pages 19 & 20 for complete Master Code Firmware programming instructions.)**
5. Connect field programmer AFP-01 to Programming Port 2 at the rear of the console. Insert memory card containing Slave Code Firmware PN 890049 (7000L) or PN 890023 (7000E) into the AFP-01. Turn on the AFP-01 and wait for the programming process to complete. (**Refer to pages 19 & 20 for complete Slave Code Firmware programming instructions.)**
6. Insert System Software memory card PN MC-7000L or PN MC-7000E into the Memory Card Port at the rear of the console. Connect a power cord to the console. Turn the console power switch on and follow the on-screen prompts to program the console. Verify that the programming process completed successfully and that the software version displayed at console startup was correct. (**Refer to page 18 for complete System Software programming instructions.)**
7. Verify that the motor and calibration systems are functional:
   - **7.1.** Attach an AE-230L-40 (7000L) or AE-230M-40 (7000E) motor with a 20:1 handpiece and an AE-7PM foot control to the console.
   - **7.2.** Use Ratio keys to set Ratio to 20:1 on the display. Depress the footswitch and verify that the motor runs. Press the CAL button and follow the on-screen prompts to complete the calibration process, verifying that the calibration completed successfully. **If calibration fails, refer to page 12 for Calibration Error Testing instructions.**
   - **7.3.** Press the SELECT button to enter “Endo Mode”. Use the Ratio keys to set the handpiece ratio to 8:1. Attach an 8:1 handpiece to the motor. Press the CAL button and follow the on-screen prompts to complete the calibration process, verifying that the calibration completed successfully. **If calibration fails, refer to page 12 for Calibration Error Testing instructions.** Press the SELECT button again to return to “Implant Mode”.
8. Connect an AE-70V2 foot control and depress each of the buttons. Verify that the function of each switch is (from lower left, clockwise): Preset Increment, Motor direction, Torque Increment, Flow ON/OFF. Select Preset 1. Press on the variable pedal and verify that the motor operates in proportion to the pedal position. (**Refer to Operator’s Manual for complete instructions on installing and using the AE-70V2 foot control.)**
9. Change the motor direction to reverse. Press and hold the footswitch for several seconds and verify that the motor runs and that the console audible indicator beeps consistently.
10. Open and close the pump door several times and verify that the door opens, closes, and latches smoothly. Insert a length of pump tubing into the peristaltic pump and verify that the pump latches securely. With the flow set to 100% depress the footswitch and verify that the pump runs smoothly.
11. **7000L UNIT ONLY:** Verify operation of the hand motor light and associated user interface functionality:
    - **11.1.** Press the LIGHT button to turn the keypad light LED off. Press the footpedal and verify that the hand motor light stays off.
    - **11.2.** Press the LIGHT button to turn the keypad light LED on. Press the footpedal and verify that the hand motor light turns on.
12. Verify operation and tactile feedback of the keypad buttons: (**Refer to Operator’s Manual for complete instructions on using the unit’s control panel).**
    - **12.1.** Press the RATIO UP and RATIO DOWN buttons, verifying that the displayed ratio changes with each press.
    - **12.2.** Press the SPEED UP and SPEED DOWN buttons, verifying that the displayed speed changes with each press.
    - **12.3.** Press the FWD/REV button repeatedly and verify that the FWD and REV LEDs change with each press.
    - **12.4.** Press the TORQUE UP and TORQUE DOWN buttons, verifying that the displayed torque changes with each press.
    - **12.5.** Press the FLOW ON/OFF button repeatedly to turn the pump off and then back on, and verify that the green FLOW ON LED illuminates. Press the FLOW UP and FLOW DOWN buttons, verifying that the displayed flow setting changes with each press.
    - **12.6.** Set Ratio to 20:1. Press the AS/MAX button repeatedly and verify that the A-S and MAX LEDs illuminate.
    - **12.7.** Press each of the preset buttons and verify that the LED for each preset button illuminates.

12.8. Press the blue standby button and verify that the display goes blank. Press the standby button again to reactivate the display.

12.9. Press and hold Preset 1. Answer 'YES' to save the settings. Answer 'YES' to edit the label. Use the left and right arrow keys and verify that the cursor moves. Use the up (YES) and down (NO) keys and verify that the letters change. Press INSERT and DELETE keys and verify that spaces are added or deleted with each press. Press the SELECT button to save the label changes.

13. Restore the factory defaults by pressing and hold**ing** the SETUP button, then answering 'YES' to the prompts.

14. Turn off console and unplug.

15. Scuff oval recess on front surface of housing with Scotch-Brite pad to remove gloss from plastic. Wipe clean with alcohol and soft cloth. When dry, place oval dome label in recess and press down firmly.

16. Apply Serial Number Label 420556-02 to the bottom of the Chassis as shown on Sheet 4.

MOTOR FIELD TESTING

NOTE: AEU-7000L/7000E motor testing in the field is limited to simple manual and visual tests that help to determine the source of the problem.

1. **Motor Rotation Test:** This test can be performed manually using a simple motor-rotation tool that can be improvised in the field or procured from Aseptico (ref. PN AE-43). The tool needs to be able to grasp the motor's internal rotor/magnet assembly and rotate it to determine if the assembly is damaged. Insert tool into motor tip and engage rotor shaft as shown in Figs. 26A & 26C. Turn tool back and forth to determine if rotor assembly moves freely (Fig. 26C). If resistance is felt, return motor/cord assembly to Aseptico for repair.

Figure 26A - Motor Rotation Tool

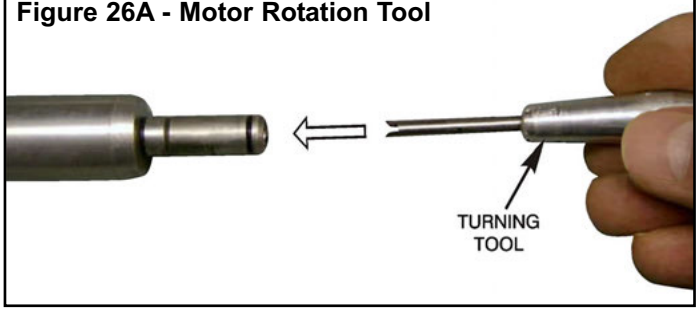


Figure 26B - Motor Internals

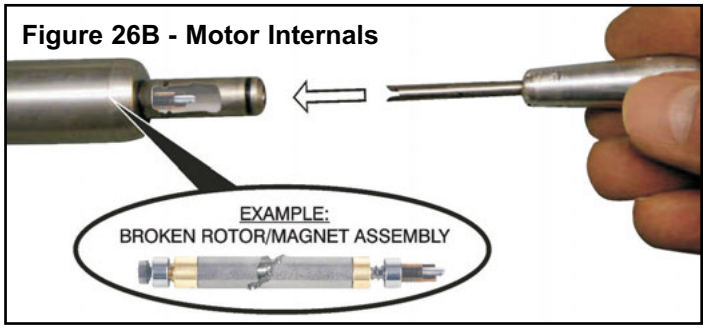
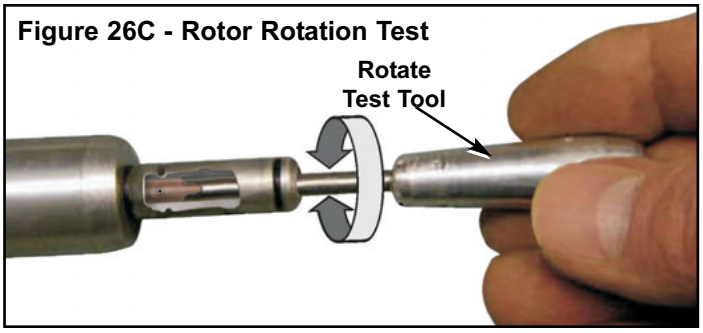


Figure 26C - Rotor Rotation Test



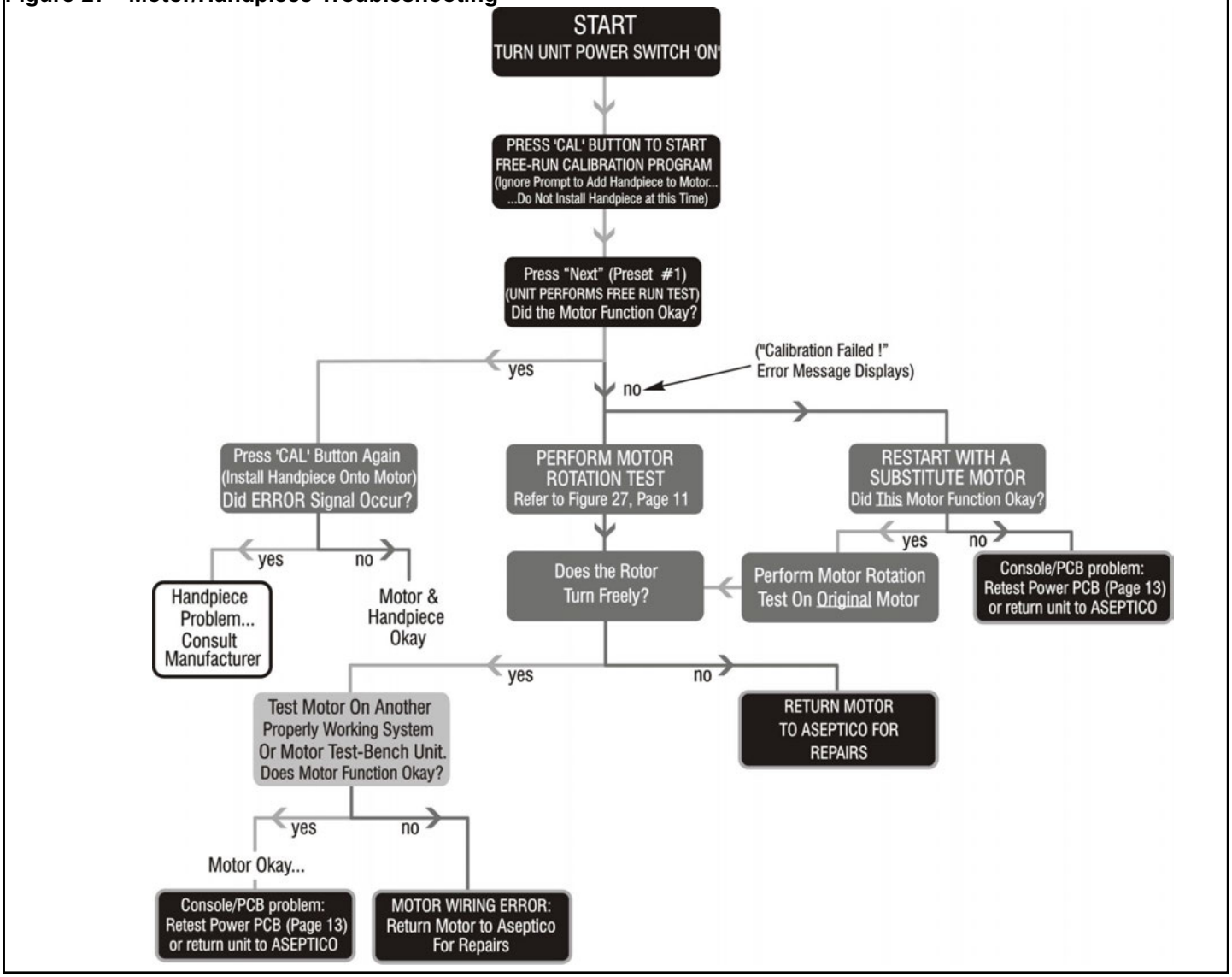
HANDPIECE CALIBRATION ERROR TESTING

NOTE: This section provides troubleshooting procedures for the “Calibration Failed !” error message which displays if the AEU-7000L/7000E motor fails during the handpiece “Free Run” calibration test (refer to Operation Manual for complete handpiece calibration instructions). This information will help determine if the source of the problem is in the motor, handpiece, or the unit console.

1. Turn AEU-7000L/7000E unit ‘On’. The Startup screen will appear.
2. Preselect ratio of the handpiece using the Ratio Up/Down buttons on the console keypad.
3. Press ‘CAL’ button to enter the calibration test. A prompt will instruct the user to install the handpiece onto the motor. Insert a dynamometer adapter, bur, or bit into the handpiece. Press “Next”. The System will automatically run the handpiece through the “Free Run” test on either increaser or reduction type handpieces. The message “Free Run In Progress / Please Wait...” will display
4. If the motor or handpiece is malfunctioning, jammed or disconnected, the “Calibration Failed ! message will display. Consult the troubleshooting chart below to pinpoint the problem.

   NOTE: The AEU-7000L/7000E power PCB board may be the source of the problem. For troubleshooting procedures specific to the PCB board, refer to the PCB testing chart on page 13. Before replacing PCB board, try calibrating unit with a new, fully operational motor, to help isolate the board as the problem.
6. If the motor, handpiece, and console are functioning properly, the message “Calibration Successful !” will display.

Figure 27 - Motor/Handpiece Troubleshooting

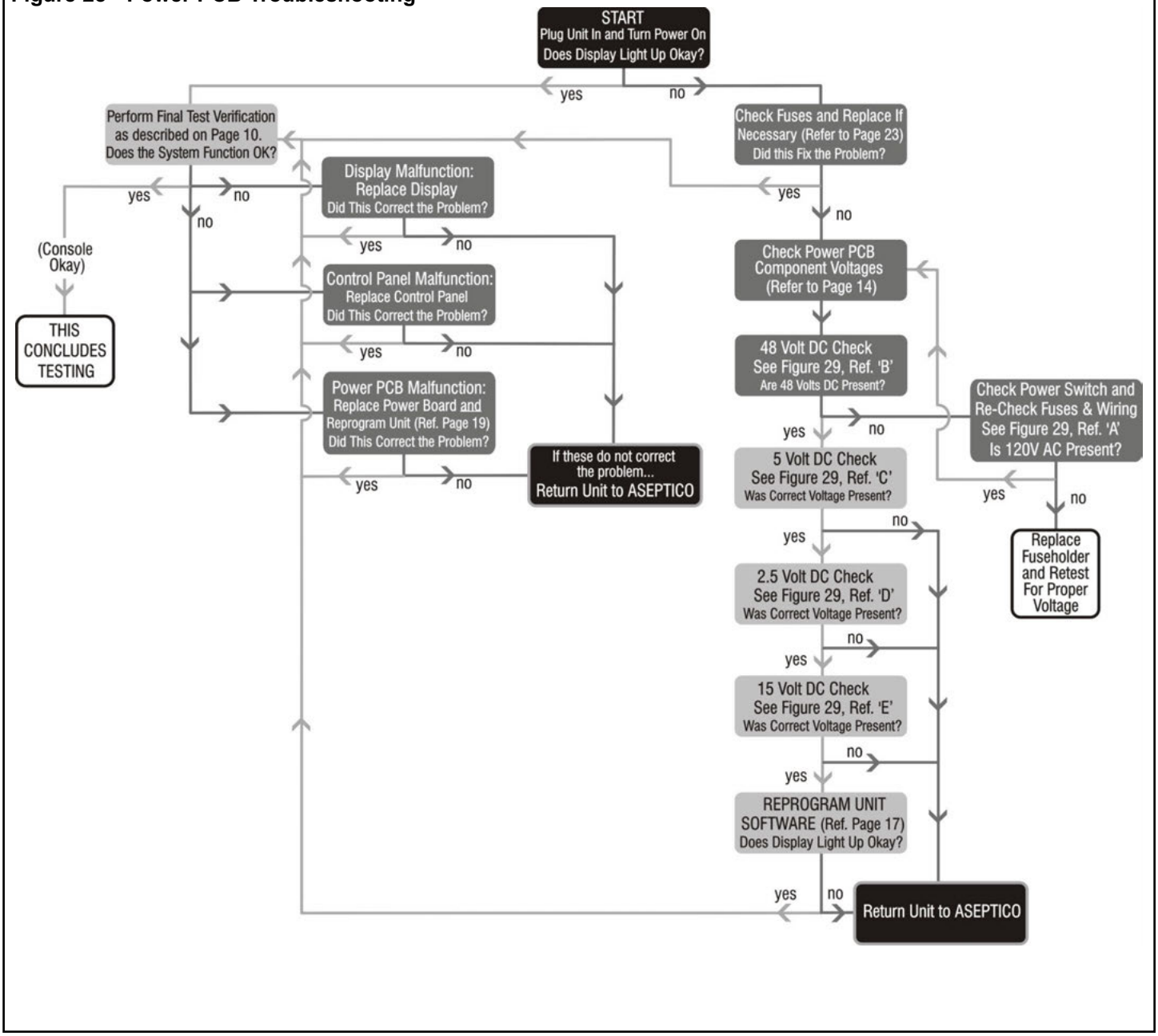

START
TURN UNIT POWER SWITCH 'ON'
PRESS 'CAL' BUTTON TO START FREE-RUN CALIBRATION PROGRAM
(Ignore Prompt to Add Handpiece to Motor...
...Do Not Install Handpiece at this Time)
Press “Next” (Preset #1)
(UNIT PERFORMS FREE RUN TEST)
Did the Motor Function Okay?
yes
no
(“Calibration Failed !”
Error Message Displays)
Press 'CAL' Button Again
(Install Handpiece Onto Motor)
Did ERROR Signal Occur?
PERFORM MOTOR ROTATION TEST
Refer to Figure 27, Page 11
RESTART WITH A SUBSTITUTE MOTOR
Did This Motor Function Okay?
yes
no
yes
no
Handpiece Problem... Consult Manufacturer
Motor & Handpiece Okay
Does the Rotor Turn Freely?
Perform Motor Rotation Test On Original Motor
Console/PCB problem: Retest Power PCB (Page 13) or return unit to ASEPTICO
yes
no
Test Motor On Another Properly Working System Or Motor Test-Bench Unit. Does Motor Function Okay?
RETURN MOTOR TO ASEPTICO FOR REPAIRS
yes
no
Motor Okay...
Console/PCB problem: Retest Power PCB (Page 13) or return unit to ASEPTICO
MOTOR WIRING ERROR: Return Motor to Aseptico For Repairs

POWER PCB TESTING

If the AEU-7000L/7000E fails to start properly, use this flowchart to pinpoint the problem. This flowchart provides additional troubleshooting procedures for the unit's main power printed circuit board (PCB).

NOTE: If the power PCB is replaced, the unit's software must be reprogrammed (refer to page 19). For troubleshooting procedures specific to the motor, refer to the motor testing chart on page 12.

Figure 28 - Power PCB Troubleshooting



POWER PCB TESTING POINTS

WARNING

Dangerous voltages are present during the following board testing. Severe electric shock can result and could prove fatal. Only qualified technicians should perform these tests.

1. Turn AEU-7000L/7000E power switch 'Off'. Remove irrigation bag, tubing, and rod. Disconnect motor/cable and foot control. Disassemble top cover from chassis (refer to page 3). Place unit upright on work bench to expose internal Power PCB.
2. **120V (US) or 230V (International) AC Check:** This test verifies that the fuses are good and the proper AC voltage is being provided to the power PCB circuit. Connect voltmeter test leads to contacts as indicated in AC Voltage Ref. 'A', Figs. 29A&B. Turn AEU-7000L/7000E power switch 'On' .

   CAUTION: High voltages present - only qualified technicians should perform this test. Use extreme caution to avoid severe electric shock.

   If 120V(+/-10V) (US) or 230V(+/-15V) (Internatonal) AC is not present, check power switch and fuses first, then if proper voltage still not present, replace Power Inlet/Fuse Holder assembly.

   Turn AEU-7000L/7000E power switch 'Off' after 120V or 230V AC test is completed.
3. **48V DC Check:** This test verifies that proper DC voltage is being provided to the power PCB circuit. Connect voltmeter test leads to contacts as indicated in DC Voltage Reference 'B', Figs. 29A&B. Turn AEU-7000L/7000E power switch 'On'.

   CAUTION: High voltages present - only qualified technicians should perform this test. Use extreme caution to avoid severe electric shock.

   If 48V(+/-1.0V) DC is not present:
   - **a.** Disconnect 48VDC Cable from Power PCB connector 'J2'.
   - **b.** Check 48VDC Cable output from DC Power Supply for 48VDC(+/-1.0V).
   - **c.** If 48VDC(+/-1.0V) Supply output is not present, replace Power Supply. If 48VDC output is present from Supply, replace PCB board.

   Turn AEU-7000L/7000E power switch 'Off' after 48VDC test is completed.
4. **5V DC Check:** This test verifies that proper DC voltage is being provided to the key pad, foot pedal, flash card, programming ports, and other PCB components. Connect voltmeter test leads to contacts as indicated in DC Voltage Reference 'C', Figs. 29A&B. Turn AEU-7000 power switch 'On'.

   CAUTION: High voltages present - only qualified technicians should perform this test. Use extreme caution to avoid severe electric shock.

   Replace PCB board if 5V(+/-0.2V) DC is not present.

   Turn AEU-7000L/7000E power switch 'Off' after 5VDC test is completed.
5. **2.5V DC Check:** This test verifies that proper DC voltage is being provided to the motor and other PCB components. Connect voltmeter test leads to contacts as indicated in DC Voltage Reference 'D', Figs. 29A&B. Turn AEU-7000L/7000E power switch 'On'.

   CAUTION: High voltages present - only qualified technicians should perform this test. Use extreme caution to avoid severe electric shock.

   Replace PCB board if 2.5V(+/-0.2V) DC is not present.

   Turn AEU-7000L/7000E power switch 'Off' after 2.5VDC test is completed.
6. **15V DC Check:** This test verifies that proper DC voltage is being provided to the motor and other PCB components. Connect voltmeter test leads to contacts as indicated in DC Voltage Reference 'E', Figs. 29A&B. Turn AEU-7000L/7000E power switch 'On'.

   CAUTION: High voltages present - only qualified technicians should perform this test. Use extreme caution to avoid severe electric shock.

   Replace PCB board if 15V(+/-1.0V) DC is not present.

   Turn AEU-7000L/7000E power switch 'Off' after 15VDC test is completed.

IMPORTANT

The Power PCB is a non-serviceable component of the AEU-7000L/7000E Systems. If not functioning properly the PCB should either be replaced with a new Assembly or returned to Aseptico for repairs.

Figure 29A - AEU-7000L Power PCB Test Points

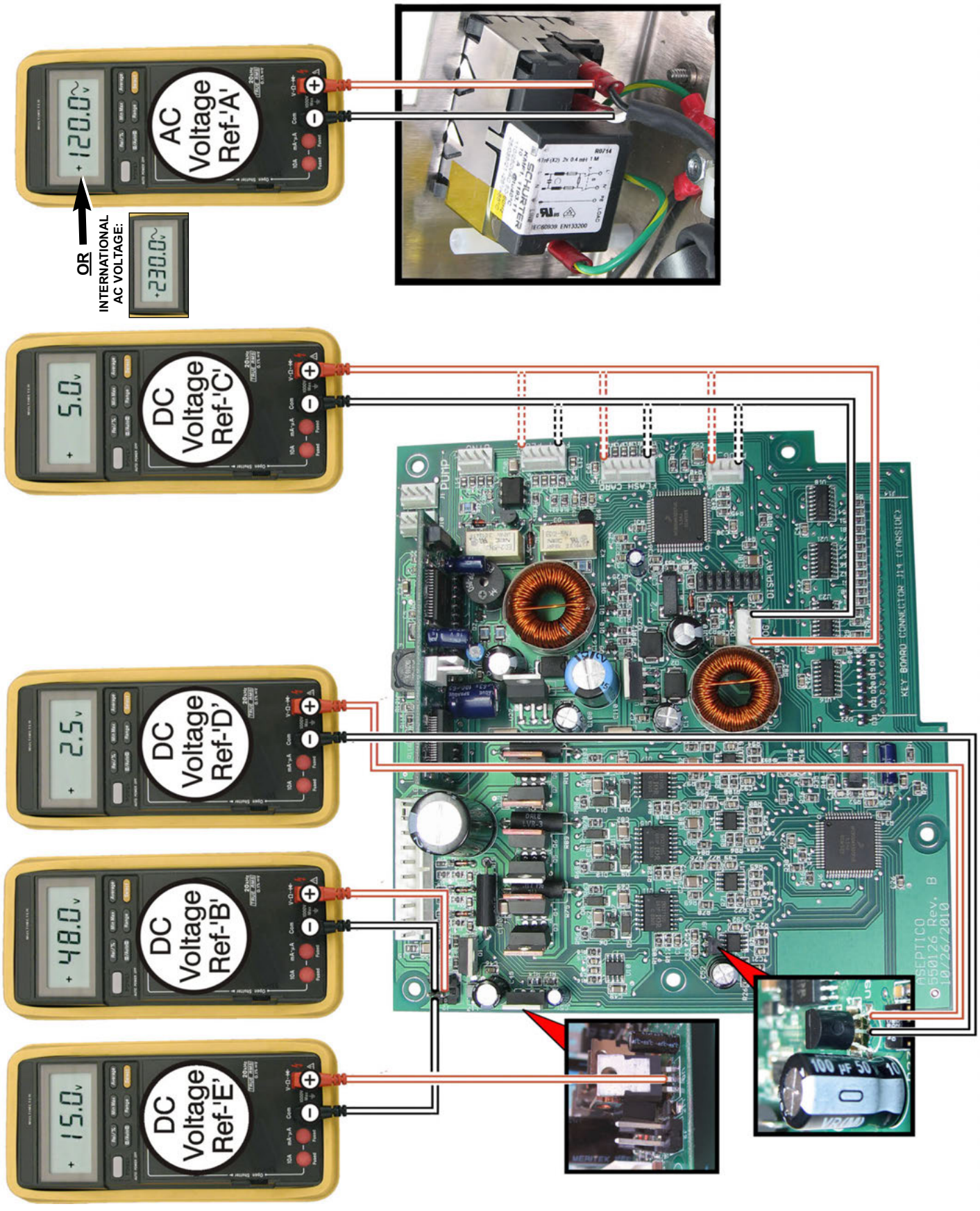
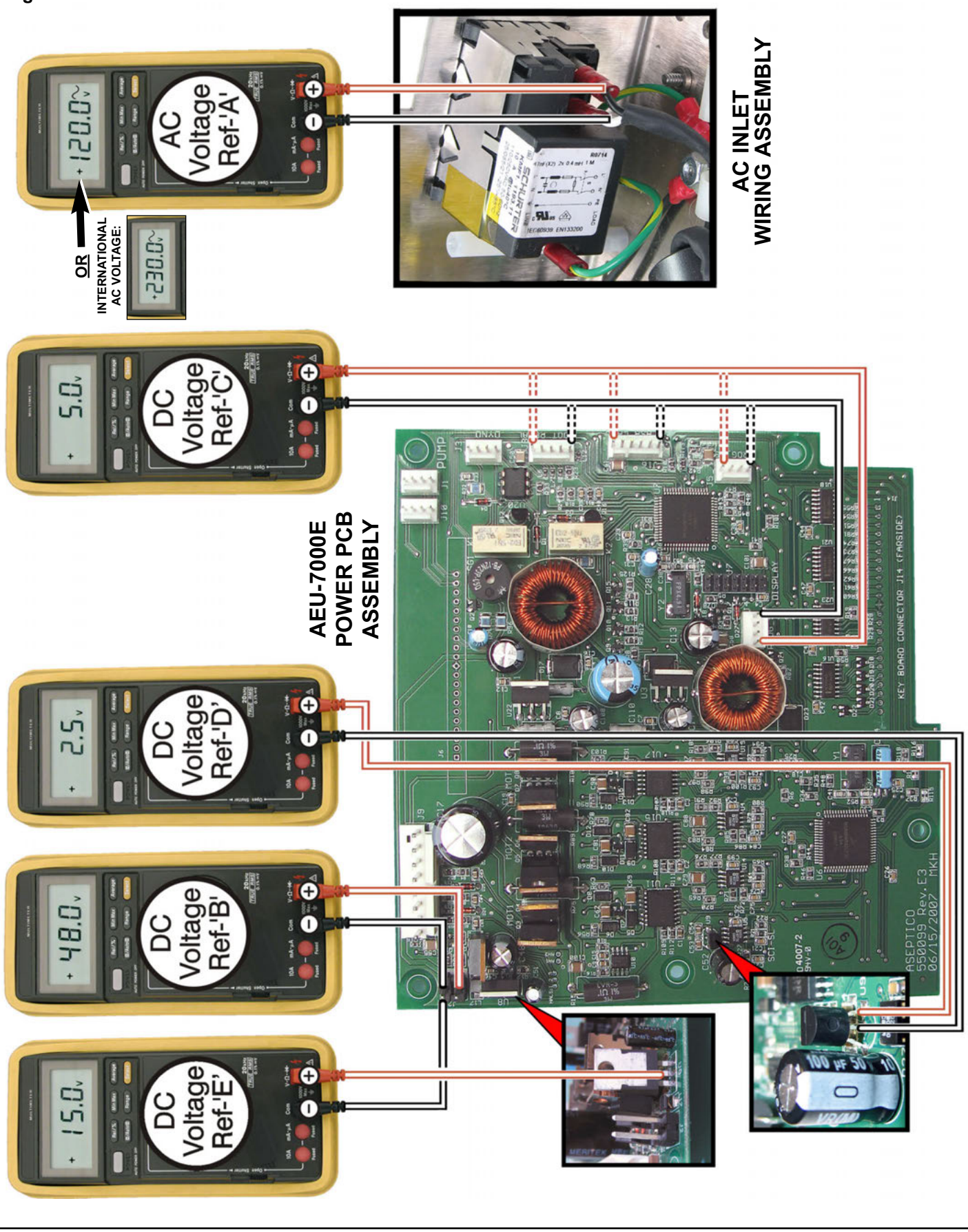


Figure 29B - AEU-7000E Power PCB Test Points



ELECTRICAL SAFETY TESTS

WARNING

Dangerous voltages are present during the following Hi-Pot testing. Severe electric shock can result and could prove fatal. Only qualified technicians should perform these tests.

Whenever repairs on any AEU-7000L/7000E unit involves safety issues, such as electrical malfunctions or changeout of critical components in the electrical circuit, i.e., main power board or transformer, it is recommended that the Hi-Pot and/or Ground Bond Safety Tests below be performed after repairs are completed. If the technician determines that Safety Tests are required, the tests should consist of three separate tests, typically performed in tandem via a single Hi-Pot test/measurement device:

1. Perform Electrical Safety Tests:

1.1. Attach an AE-230L-40 motor (7000L) or an AE-230M-40 motor (7000E) to the unit console.

1.2. Conduct a Ground Bond Test between Earth Ground at the power inlet and the chassis at the pump drain opening (see Fig. 30). Test parameters are 25 Amps for two seconds with an allowed resistance of no more than 0.1 Ohms.

1.3. Conduct a Dielectric Withstand Test between Mains at the power inlet and the pump drain opening (see Fig. 30). Perform test with the power inlet switch in the “ON” position. Test parameters are 2520 VDC for one second with an allowed leakage current of 1.0mA.

1.4. Conduct a Dielectric Withstand Test between Mains at the power inlet and the motor housing (see Fig. 31). Test is to be performed with the power inlet switch in the “ON” position and the return lead of the test equipment connected to the E-coupling of the motor body. Test parameters are 4250 VDC for one second with an allowed leakage current of 1.0mA.

2. Using a multimeter (Amprobe 38XR-A or equivalent meter with 0.01nF resolution), measure the capacitance between the sheet metal chassis of the console and the DC return pin (Pin #4) of the footswitch connector (see Fig. 32). Result is acceptable if the capacitance measured is 5.3-8.0 nF.

IMPORTANT: Any system that fails any of the above tests must be removed from service and thoroughly examined, repaired and retested by a qualified technician.

Figure 30

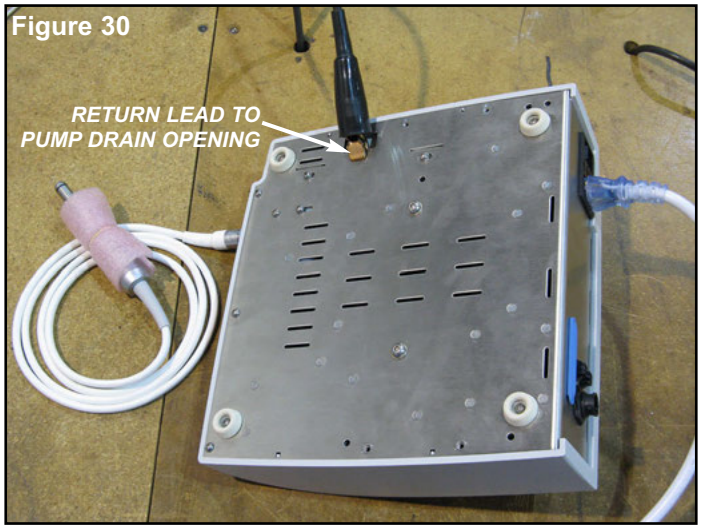


Figure 31

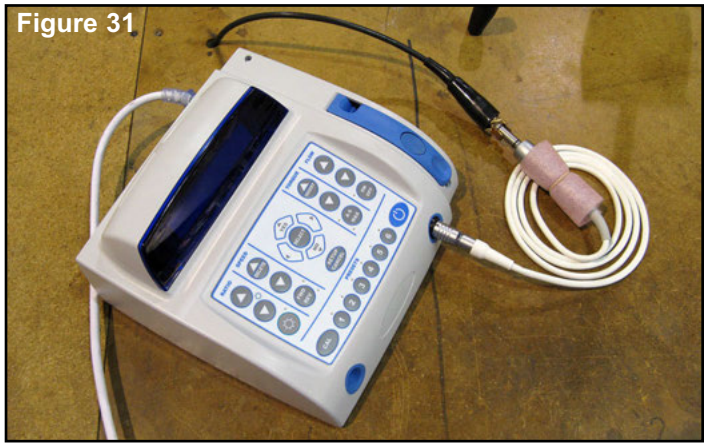
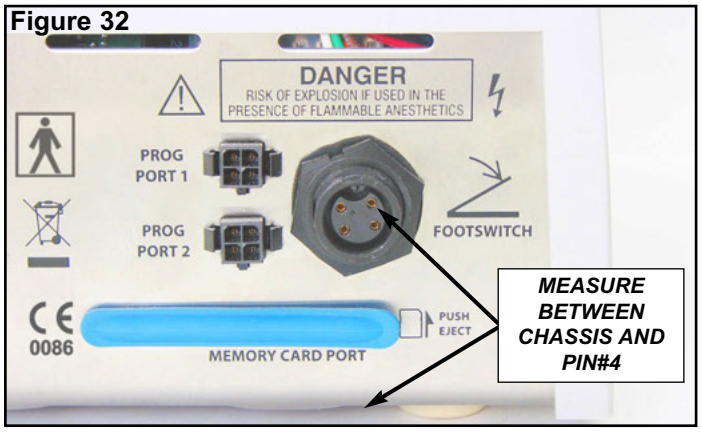


Figure 32



NOTE: Although Aseptico uses the Associated Research, Inc. Model 7564SA Hipot/Ground Tester for these tests, alternative equipment with equivalent setup and testing specifications may be used. Ensure that the above test parameters are set up correctly before conducting the tests.

REPROGRAMMING SYSTEM SOFTWARE

Figure 33

Each System has the ability to load software updates and enhance its functionality, should this be desired. A card slot, labeled “Memory Card Port”, is provided on the back of each unit (see Fig. 33). This Port accepts memory cards, PN’s MC-7000L (7000L) or MC-7000E (7000E), which are very similar to those used in common consumer devices. These cards, available from Aseptico, enable a user to update software or replace existing software that might have been accidentally erased or corrupted. Contact Aseptico for more information on card usage and availability. To reprogram a unit, follow the Steps below:

Programming Steps:

1. Turn ‘Off’ the Main Power Switch on the back panel.
2. Grasp the right-hand end of the rubber dust cover for the Memory Card Port and pry open the cover to expose the card slot.
3. Insert the new MC-7000L or MC-7000E memory card into the slot with label facing upward (card terminals should face downward). Carefully and slowly press card inward until a ‘click’ is felt, then release the card.
4. Turn the Main Power Switch (on the back panel) ‘On’.
5. The Display will show the following message:

   Memory Card Detected.
   Re-program? (Yes / No)

   • Press the ‘Yes’ key on the Control Panel.
6. The Display will then show the following message:

   Presets will be erased!
   Continue? (Yes / No)

   • Press the ‘Yes’ key on the Control Panel.
7. The Display will show the following message:

   Programming...

   • A status bar will indicate the progress of the programming.
8. When the programming is complete, the Display will show the following message:

   Programming successful.
   Eject card.

   • Press the card inward slightly, then release it to eject it. When the card is ejected, the System will reset with normal power-up screen displayed.
9. Remove the memory card and store it in a safe place. Close the rubber dust cover on the Memory Card Port.

   In the event that the programming procedure is interrupted, the unit will display the following message:

   Programming Failed Then:

   Console Software Error.
   Re-program unit.

   Re-start the programming procedure from Step #1 (Remember to turn main power ‘Off’ before reprogramming).

REPROGRAMMING SYSTEM FIRMWARE

The AEU-7000L/7000E Units' internal components are controlled by three software microchips. The software in these chips can be updated or replaced by using the AFP-01 Field Programmer (see Fig. 34) to upload the new firmware directly into the microcontrollers. Refer to the firmware below and its respective programming port when uploading:

A. Master Code Firmware (Port 1):
7000L: PN 890048
7000E: PN 890022

B. Slave Code Firmware (Port 2):
7000L: PN 890049
7000E: PN 890023

C. Motor Driver Firmware (J1 Connector):
7000L & 7000E: PN 890021

Contact Aseptico for availability on the latest firmware. Follow the appropriate steps below to reprogram the microcontrollers:

A. Master Code Firmware

1. Turn Off all power to the AEU-7000L/E Units.
2. Turn Off the programming switch within the AFP-01 Field Programmer (see Fig. 35).
3. Install battery into AFP-01 Field Programmer, as shown in Figure 35.
4. Install **Master Card, PN: 890048 (7000L) or PN: 890022 (7000E)**, into the card holder located on Programmer PCB (see Fig. 35).
5. Insert the 4-pin square connector (for an HC08 Microcontroller) into the programming **Port-1** on the back of the Unit, making sure that the connector latch is properly oriented with the mating connector.
6. Turn On the programming switch within the AFP-01 Programmer.
7. The Green & Red LED's on the Programmer will operate in the following sequence when programming is successful: **IMPORTANT:** The Red LED will remain On in the event of improper programming.
   - Green & Red LED's turn On for approx. one second.
   - Green & Red LED's turn Off for approx. one second.
   - Green & Red LED's again turn On for approx. one second.
   - Green & Red LED's again turn Off for approx. one second.
   - Green LED remains On for about two seconds.
   - Green LED flashes On and off during programming.
   - Green LED remains On at the completion of programming.
8. Turn Off the programming switch within the AFP-01 Programmer and remove the connector from Unit. Master Code Programming is completed.

Figure 34

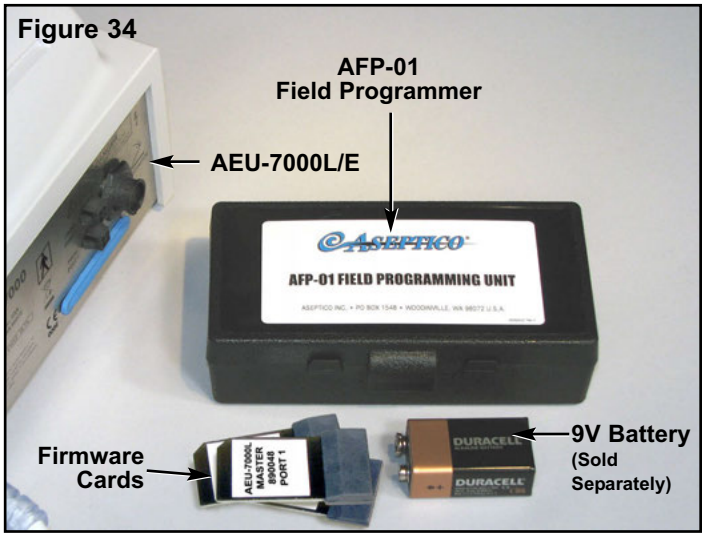


Figure 35

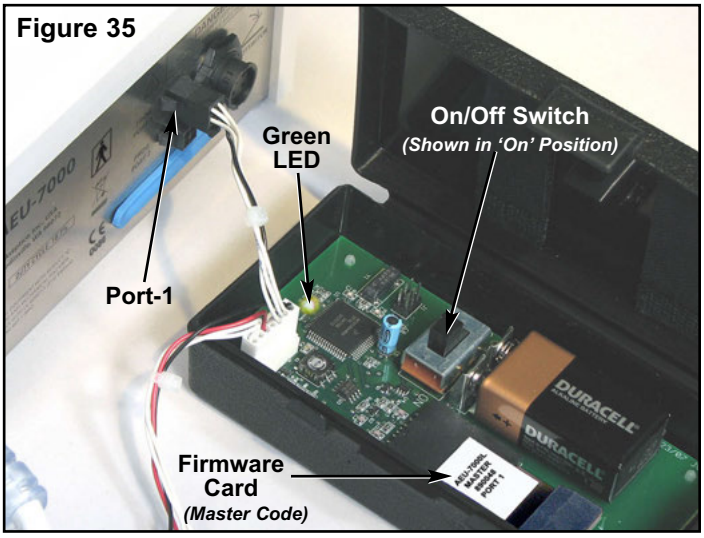
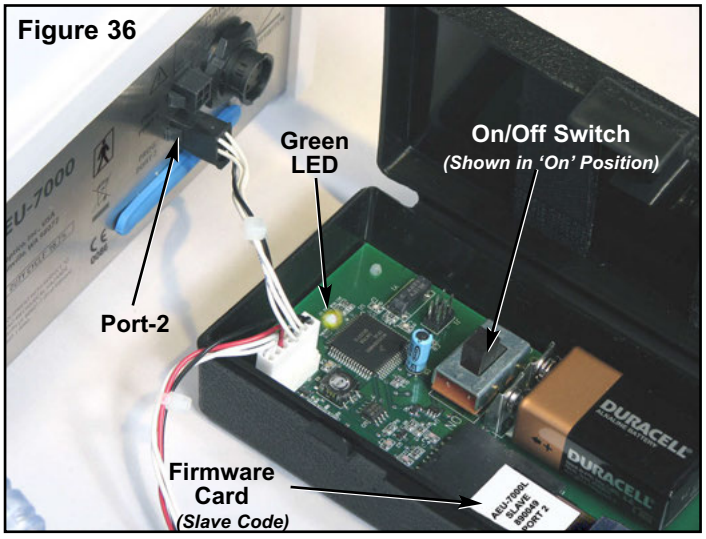


Figure 36



B. Slave Code Firmware

1. Turn Off all power to the AEU-7000L/E Units.
2. Turn Off the programming switch within the AFP-01 Field Programmer (see Fig. 36).
3. Install battery into AFP-01 Field Programmer, as shown in Figure 36.
4. Install **Slave Card, PN: 890049 (7000L) or PN: 890023 (7000E)**, into the card holder located on Programmer PCB (see Fig. 36).
5. Insert the 4-pin square connector (for an HC08 Microcontroller) into the programming **Port-2** on the back of the Unit, making sure that the connector latch is properly oriented with the mating connector.
6. Turn On the programming switch within the AFP-01 Programmer.
7. The Green & Red LED's on the Programmer will operate in the following sequence when programming is successful: **IMPORTANT:** The Red LED will remain On in the event of improper programming.
   - Green & Red LED's turn On for approx. one second.
   - Green & Red LED's turn Off for approx. one second.
   - Green & Red LED's again turn On for approx. one second.
   - Green & Red LED's again turn Off for approx. one second.
   - Green LED remains On for about two seconds.
   - Green LED flashes On and off during programming.
   - Green LED remains On at the completion of programming.
8. Turn Off the programming switch within the AFP-01 Programmer and remove the connector from Unit. Slave Code Programming is completed.

C. Stepper Motor Driver Firmware

1. Turn Off all power to the AEU-7000L/E Units.
2. Remove top cover from Unit (refer to page 3).
3. Disconnect Display ribbon cable from power PCB board (see Fig. 37).
4. Turn Off the programming switch within the AFP-01 Field Programmer (see Fig. 38).
5. Install battery into AFP-01 Field Programmer, as shown in Figure 38.
6. Install **Motor Driver Card, PN: 890021**, into the card holder located on Programmer PCB (see Fig. 38).
7. Insert the white 4-pin in-line connector into the programming **connector 'J1'** on the motor module (see Figs. 37 & 38), making sure that the connector latch is properly oriented with the mating connector.
8. Turn On the programming switch within the AFP-01 Programmer.

Figure 37

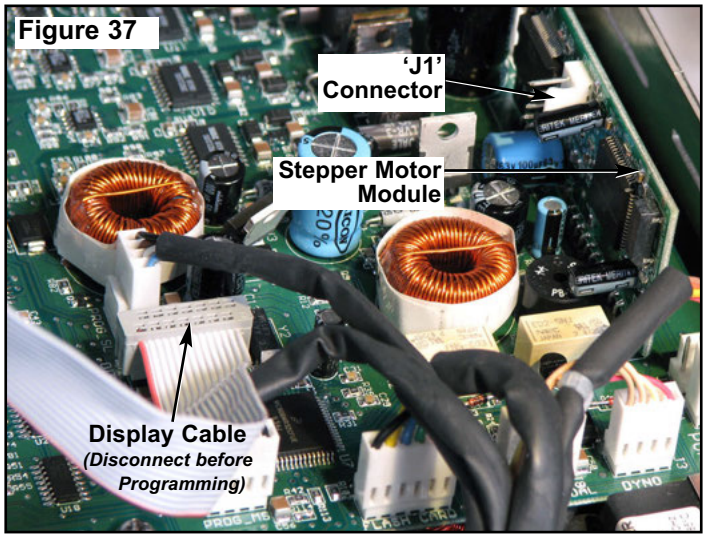
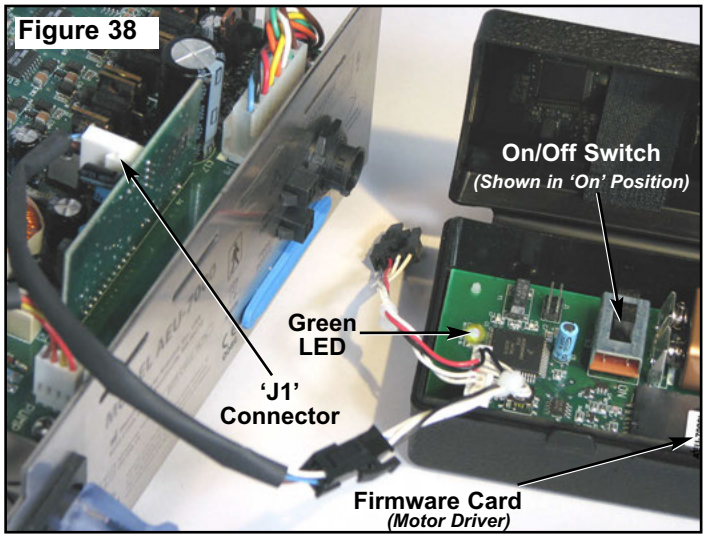


Figure 38



9. The Green & Red LED's on the Programmer will operate in the following sequence when programming is successful: **IMPORTANT:** The Red LED will remain On in the event of improper programming.
   - Green & Red LED's turn On for approx. one second.
   - Green & Red LED's turn Off for approx. one second.
   - Green & Red LED's again turn On for approx. one second.
   - Green & Red LED's again turn Off for approx. one second.
   - Green LED remains On for about two seconds.
   - Green LED flashes On and off during programming.
   - Green LED remains On at the completion of programming.
10. Turn Off the programming switch within the Programmer and remove the connector from Unit.
11. Reconnect Display ribbon Cable. Reattach Cover. Motor Driver Programming is completed.

STERILIZATION PROCEDURES:

WARNING - Sterilize the motor between each patient use.

WARNING - Use of a sterilization method or temperatures other than what are prescribed may damage the motor or present a risk of cross-contamination between patients.

CAUTION - Do not soak or submerge the motor in any liquid.

STERILIZATION:

Pre-clean

1) Brush off any visible signs of debris from the motor and cord.

2) Thoroughly clean the device with a moist cloth or towel to remove any remaining signs of debris.

Sterilize

3) Select one of the three following sterilization methods (A. B. or C.):

Wrapped Sterilization – Place in an appropriately sized sterilization pouch and seal it.

A. Standard autoclaving (Gravity displacement method)

Time: 15 min

Temperature: 132° C (270° F)

Dry time: 30 minutes

B. Pre-vacuum (dynamic-air-removal)

Time: 4 minutes

Temperature: 132° C (270° F)

Dry time: 40 minutes

Flash Sterilization – For immediate use only.

C. Unwrapped standard autoclaving (Gravity displacement method)

Time: 10 minutes

Temperature: 132° C (270° F)

No dry time is required for flash sterilization.

Motor & Cord Assembly:

The entire motor and cord assembly is fully autoclavable. Loosely coil the motor cord when autoclaving. Avoid sharply bending the cord when autoclaving.

Fig.39 MOTOR & CORD STERILIZATION

NOTE: Call Aseptico Inc. at 1-800-426-5913 for any questions or clarifications on this sterilization procedure.

MAINTENANCE & CLEANING:

HANDPIECES - Thorough cleaning and lubrication of handpieces after each use and before sterilization is very important to ensure proper operation and service life of the handpiece. Follow the instructions provided with the handpiece for complete maintenance instructions.

MOTOR - **IMPORTANT!** Protect motor from excess oil draining from handpiece. After lubricating and before autoclaving, stand handpiece by its base on a paper towel and allow excess oil to drain (see Figure 40).

Fig.40

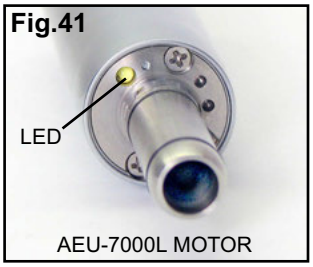
⚠ WARNING

- Do not attempt to disassemble the motor or motor connector.
- Do not oil or lubricate the motor.
- Do not attach a handpiece to the motor while the motor is running.
- Do not bend motor cord sharply.
- The motor is sensitive to shock. Do not drop or impact motor against a hard surface.

Failure to comply with any of the above instructions may void your warranty.

AEU-7000L MOTOR LED LENS CLEANING - The lens of the LED light on the AEU-7000L motor (see Fig. 41) is soft and can be damaged. It should not be exposed to dust and debris. Excessive dust and debris may cause a drastic decrease in optical output. In the event that the light requires cleaning, first try a gentle swabbing, using a lint-free swab. If needed, use a lint-free swab and isopropyl alcohol to gently remove dirt from the lens. **Do not use other solvents** as they may adversely react with the LED assembly.

Fig.41



AEU-7000L MOTOR

CONSOLE - The exterior of the console may be cleaned by wiping with a soft cloth moistened with a mild detergent or a 1:10 bleach solution (1 part household bleach to 10 parts water). **IMPORTANT:** Use of other cleaning or disinfecting solutions may damage the console and may void the warranty.

SILICONE WATER LINES - The silicone water lines used for the pump are fully autoclavable:

Pre-Cleaning: Before sterilization, run clean water through the tubing for 30 seconds to expel any stagnant water. **NOTE:** Do not use disinfectants on the tubing set. Bacteria and viruses will be neutralized during sterilization.

Sterilization: Sterilize tubing at 132º C (270º F) for 10 minutes.

FOOT CONTROL - The exterior of the foot control may be cleaned by wiping with a soft cloth moistened with mild detergent or disinfecting solution. When cleaning, remove handle from foot control and wipe clean with disinfectant, then reinstall handle.

SPECIFICATIONS::

Console Dimensions:
9.98"W x 9.42"L x 5.10"H
(25.3 cm x 23.9 cm x 12.9 cm)

Console Weight:
7.3 lbs (3.3 kg)

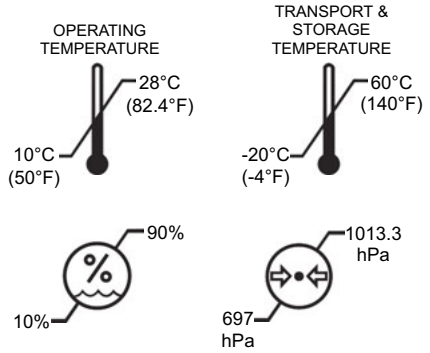
Power:
100-240V ∿
1.1 - 0.5 A
50-60 Hz

Fuses:
1.6A, 250V, Slo-Blow Type

Duty Cycle:
16.7%

NOTE:
The appliance inlet is the mains disconnect means.

Environmental Conditions:
- Operating Temperature: 10° to 28°C (50° to 82.4°F)
- Transportation & Storage Temperature:
- -20° to 60°C (-4° to 140°F)
- Relative Humidity: 10% to 90% noncondensing
- Altitude: 0 to 3,048 meters (0 to 10,000 feet)



Manufacturer

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Woodinville
WA 98072
USA

EC REP

Advena Ltd
Pure Offices
Plato Close
Warwick
CV34 6WE
UK

CLASSIFIED C UL US
41EJ

MEDICAL ELECTRIC EQUIPMENT WITH RESPECT TO ELECTRIC SHOCK, FIRE AND MECHANICAL HAZARDS ONLY IN ACCORDANCE WITH UL 60601-1 (First Edition) and CAN/CSA C22.2 No. 601.1-M90

WARNING: This device has been tested and found to comply with the emissions requirements of IEC 60601-1-2:2001-09. These requirements provide reasonable protection against harmful electromagnetic interference in a typical medical installation. However, high levels of radio-frequency (RF) emissions from electrical devices, such as cellular phones, may disrupt the performance of this device. To mitigate disruptive electromagnetic interference, position this device away from RF transmitters and other sources of electromagnetic energy.

GENERAL TROUBLESHOOTING:

Problem:	Correction:
Console does not light when turned on:	• Check console to power connection. • Check fuse. If blown, replace with 1.6A/250V slo-blow fuse.
Console lights when turned on, but handpiece does not turn:	• Check motor plug connection. • Check foot pedal connection. • Depress foot pedal. • Increase RPM. • Increase Torque setting • Check that bur/drill is properly seated in the handpiece and the collet is closed.
No water flow from pump to handpiece:	• Check that pump is on and flow level is sufficient. • Check that water container seal is completely punctured. • Make sure the irrigation tubing is properly installed in pump door and flow is in the correct direction.
Irrigation tube leaks:	• Replace worn tube section located under the pump door with a new section from the extra tube set provided with the system.
Motor slowing down or sluggish:	• Check for dirty, under-lubricated handpiece. • Check if handpiece lubricant is draining into motor. After lubricating and before autoclaving, stand handpiece on its base to let excess lubricant drain out.
System functions displaying incorrectly:	• Verify that ratio setting matches handpiece ratio. Use calibration function. • Turn power switch Off, wait 5 seconds, then turn back On to reset.
Cannot remove motor/cord from unit:	• Grasp the strain relief directly behind the cord connector and gently push inward. Then, grasp the connector body near the red dot and pull the connector straight out of the receptacle.

CHANGING THE FUSE:

⚠ WARNING

Turn the power off and unplug the unit before following the steps below.

1. Remove the Fuse Holder from the Power Inlet connector (see Fig. 42).
2. Replace the fuses in the Fuse holder.

   Replacement Fuses:
   1.6A, 250V slo-blow fuse
   (Fuse size: 5 x 20mm)
3. Reinstall the Fuse Holder.

NOTE: The AEU-7000L/7000E features auto-sensing, global voltage compatibility. The fuse indicated is correct for 100V-240V 50/60 Hz line voltage.

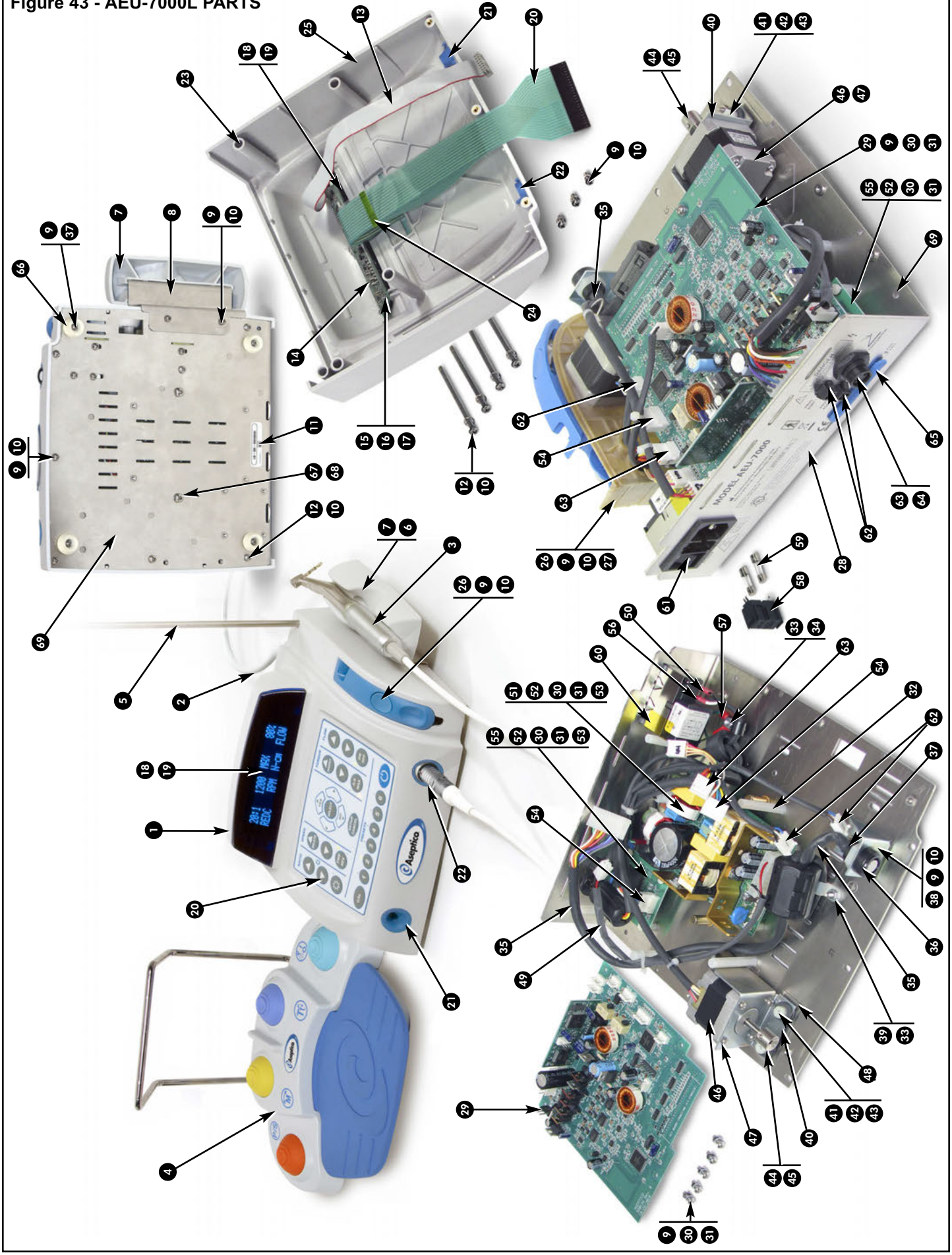
Figure 42

AEU-7000L-70V PARTS LIST (See Fig. 43)

ITEM	DESCRIPTION	PART NO.	Qty
1	FINAL ASSY AEU-7000L	120368	1
2	LINECORD WHT HOSPT GRDE 5-15PH6C	840079	1
3	MOTOR/CABLE ASSY	AE-230L-40	1
4	FINAL ASSY AE-70V2 FOOT CONTROL VAR	120391-01	1
5	HOLDER IRRIGANT BAG	461541	1
6	ADAPTER HANDPIECE	461558	1
7	HANDPIECE CRADLE	461561-01	1
8	BRACKET CRADLE	461562	1
9	M/S STNLS PHDPHL 6-32 X 3/8	510406	18
10	WASHER INT STAR S/S #6	510419	13
11	LABEL SERIAL NUMBER AEU-7000L	420556-02	1
12	M/S 6/32 X 2-1/2 PNHD PH SS	510643	4
13	CABLE RIBBON SOC TO SOC 14 POS	870300	1
14	VACUUM FLUORESCENT DISPLAY ASSY	330503	1
15	NUT HEX 4-40 SML PTN PLTD	510005	2
16	WASHER SPLIT PLTD #4	510004	2
17	STUD PRESS	510625	2
18	DISPLAY FILTER	461548	1
19	GASKET DISPLAY	461549	1
20	OVERLAY MEMBRANE CONTROL PNL	420860	1
21	BEZEL DYNAMOMETER	461538	1
22	BEZEL MOTOR CONNECTOR	461545	1
23	SPACER COVER AEU-7000	461560	4
24	TAPE KAPTON 1/4 INCH WIDE ROLL	490088	2"
25	TOP COVER	461547	1
26	PUMP ASSY PERISTALTIC	330471	1
27	ISOLATION PAD PUMP BRACKET AEU-7000	461995	2
28	CHASSIS ASSY AEU-7000L	330576	1
29	PCB ASSY POWER & STEPPR BRD CMPL	330575	1
30	WASHER SPLIT PLTD #6	510010	13
31	WASHER STNLS NAS 620-C6 .143IDx.267OD	510587	13
32	STANDOFF 1/4 HEX #6 X 1-7/8 NYL	510626	5
33	NUT KEPS PLTD 6-32	510006	3
34	WASHER EXT STAR PLTD #6	510007	2
35	MOTOR HARNESS ASSY	875110	1
36	NUT MOTOR CONNECTOR CMPL	461969	1
37	NUT HEX MOTOR CONNECTOR	461970	1
38	BRACKET CONNECTOR	461546	1

ITEM	DESCRIPTION	PART NO.	Qty
39	CLAMP CABLE NYLON 5/16 DIA X .203 HOLE	510410	1
40	BRACKET DYNAMOMETER AEU-7000	461551	1
41	NUT NYLON LOCK 6-32	510745	3
42	GROMMET 1/4" NEOPREME BLK	870185	3
43	SPACER NYL 1/4RND X 1/4LX #6	510163	3
44	ADAPTER DYNAMOMETER	461540	1
45	SETSCREW 8-32X1/8 S/S CUP POIN	510278	1
46	DYNAMOMETER ASSEMBY	330481	1
47	M/S PHD PHL M3X.5X6 SEMS W/WSR	510627	4
48	INSULATOR DYNAMOMETER	461979	1
49	CABLE ASSY DC 48 VOLT	875076	1
50	CABLE ASSY AC LINE IN	875077	1
51	POWER SUPPLY 48VDC 2.9A INPUT 100-240VAC	840113	1
52	M/S PANSLT NYLON 6-32 X 5/16	510746	8
53	STANDOFF NYLON 6-32 X 7/16 L X 1/4 HEX	510747	8
54	CABLE ASSY MEMORY PCB	875078	1
55	PCB ASSY MEMORY CARD	330507	1
56	CABLE ASSY AC EARTH	875075	1
57	CABLE ASSY GROUND	875112	1
58	FUSEDRAWER 2 POLE	840060	1
59	FUSE 5X20MM SLO-BLO 1.60A	830040	2
60	TAPE KAPLON 1 INCH WIDE ROLL	490144	1"
61	POWER INLET FUSED 10 AMP W/LINE FILTER	840086	1
62	CABLE ASSY PROGRAMMING	875057-01	2
63	FOOTSWITCH HARNESS ASSY	875074	1
64	WASHER FLAT .625 ID .875 OD NYL	510648	1
65	DUST COVER FLASH CARD	461606	1
66	FOOT BUMPER RECESS .75 X .25	850066	4
67	C/S BTNSOC STNLS 10-32X1/2	510312	2
68	WASHER INT STAR S/S #10	510421	2
69	CHASSIS BASE AEU-7000 CMPL	461955-08	1
NOT SHOWN	TUBING SET BAG	AE-23	1
NOT SHOWN	TUBING SET PUMP SECTION	AE-23-PUMP	1
NOT SHOWN	MEMORY CARD ASSY AEU-7000L	MC-7000L	1
NOT SHOWN	SOFTWARE AEU-7000 MOTOR DRIVER	890021	1
NOT SHOWN	SOFTWARE AEU-7000 MASTER CODE-PORT 1	890048	1
NOT SHOWN	SOFTWARE AEU-7000 SLAVE CODE-PORT 2	890049	1
NOT SHOWN	FOOTSWITCH ON/OFF 4 PIN MALE	AE-7PM	1

Figure 43 - AEU-7000L PARTS

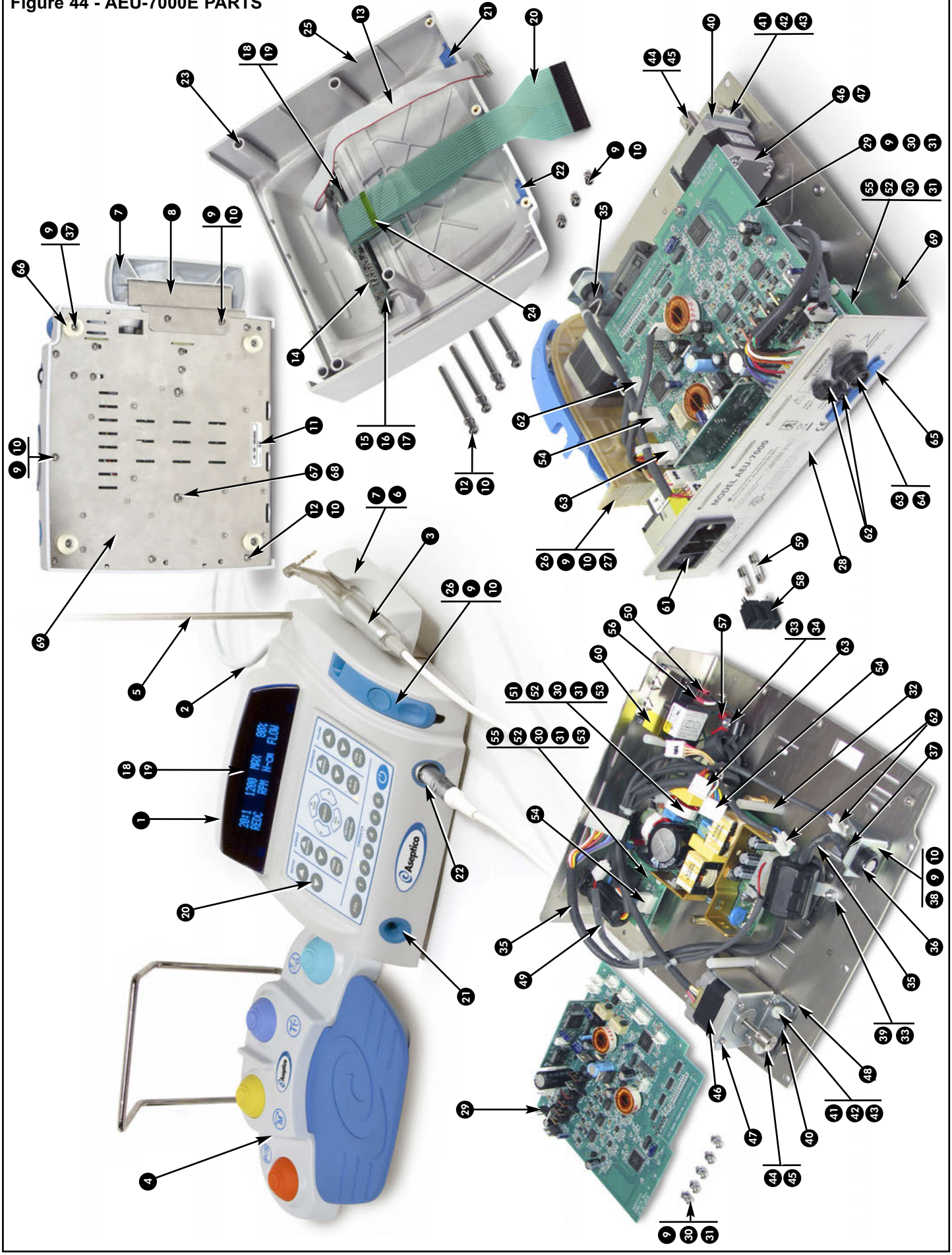


AEU-7000E-70V PARTS LIST (See Fig. 44)

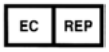
ITEM	DESCRIPTION	PART NO.	Qty
1	FINAL ASSY AEU-7000E	120330	1
2	LINECORD WHT HOSPT GRDE 5-15PH6C	840079	1
3	MOTOR/CABLE ASSY	AE-230M-40	1
4	FINAL ASSY AE-70V2 FOOT CONTROL VAR	120391-01	1
5	HOLDER IRRIGANT BAG	461541	1
6	ADAPTER HANDPIECE	461558	1
7	HANDPIECE CRADLE	461561-01	1
8	BRACKET CRADLE	461562	1
9	M/S STNLS PHDPHL 6-32 X 3/8	510406	18
10	WASHER INT STAR S/S #6	510419	13
11	LABEL SERIAL NUMBER AEU-7000L/7000E	420556-02	1
12	M/S 6/32 X 2-1/2 PNHD PH SS	510643	4
13	CABLE RIBBON SOC TO SOC 14 POS	870300	1
14	VACUUM FLUORESCENT DISPLAY ASSY	330503	1
15	NUT HEX 4-40 SML PTN PLTD	510005	2
16	WASHER SPLIT PLTD #4	510004	2
17	STUD PRESS	510625	2
18	DISPLAY FILTER	461548	1
19	GASKET DISPLAY	461549	1
20	OVERLAY MEMBRANE CONTROL PNL	420584	1
21	BEZEL DYNAMOMETER	461538	1
22	BEZEL MOTOR CONNECTOR	461545	1
23	SPACER COVER AEU-7000	461560	4
24	TAPE KAPTON 1/4 INCH WIDE ROLL	490088	2"
25	TOP COVER	461547	1
26	PUMP ASSY PERISTALTIC	330471	1
27	ISOLATION PAD PUMP BRACKET AEU-7000	461995	2
28	CHASSIS ASSY AEU-7000	330469	1
29	PCB ASSY POWER & STEPPR BRD CMPL	330514	1
30	WASHER SPLIT PLTD #6	510010	13
31	WASHER STNLS NAS 620-C6 .143IDx.267OD	510587	13
32	STANDOFF 1/4 HEX #6 X 1-7/8 NYL	510626	5
33	NUT KEPS PLTD 6-32	510006	3
34	WASHER EXT STAR PLTD #6	510007	2
35	MOTOR HARNESS ASSY	875073	1
36	NUT MOTOR CONNECTOR CMPL	461969	1
37	NUT HEX MOTOR CONNECTOR	461970	1
38	BRACKET CONNECTOR	461546	1

ITEM	DESCRIPTION	PART NO.	Qty
39	CLAMP CABLE NYLON 5/16 DIA X .203 HOLE	510410	1
40	BRACKET DYNAMOMETER AEU-7000	461551	1
41	NUT NYLON LOCK 6-32	510745	3
42	GROMMET 1/4" NEOPREME BLK	870185	3
43	SPACER NYL 1/4RND X 1/4LX #6	510163	3
44	ADAPTER DYNAMOMETER	461540	1
45	SETSCREW 8-32X1/8 S/S CUP POIN	510278	1
46	DYNAMOMETER ASSEMBY	330481	1
47	M/S PHD PHL M3X.5X6 SEMS W/WSR	510627	4
48	INSULATOR DYNAMOMETER	461979	1
49	CABLE ASSY DC 48 VOLT	875076	1
50	CABLE ASSY AC LINE IN	875077	1
51	POWER SUPPLY 48VDC 2.9A INPUT 100-240VAC	840113	1
52	M/S PANSLT NYLON 6-32 X 5/16	510746	8
53	STANDOFF NYLON 6-32 X 7/16 L X 1/4 HEX	510747	8
54	CABLE ASSY MEMORY PCB	875078	1
55	PCB ASSY MEMORY CARD	330507	1
56	CABLE ASSY AC EARTH	875075	1
57	CABLE ASSY GROUND	875112	1
58	FUSEDRAWER 2 POLE	840060	1
59	FUSE 5X20MM SLO-BLO 1.60A	830040	2
60	TAPE KAPLON 1 INCH WIDE ROLL	490144	1"
61	POWER INLET FUSED 10 AMP W/LINE FILTER	840086	1
62	CABLE ASSY PROGRAMMING	875057-01	2
63	FOOTSWITCH HARNESS ASSY	875074	1
64	WASHER FLAT .625 ID .875 OD NYL	510648	1
65	DUST COVER FLASH CARD	461606	1
66	FOOT BUMPER RECESS .75 X .25	850066	4
67	C/S BTNSOC STNLS 10-32X1/2	510312	2
68	WASHER INT STAR S/S #10	510421	2
69	CHASSIS BASE AEU-7000 CMPL	461955-08	1
NOT SHOWN	TUBING SET BAG	AE-23	1
NOT SHOWN	TUBING SET PUMP SECTION	AE-23-PUMP	1
NOT SHOWN	MEMORY CARD ASSY AEU-7000E	MC-7000E	1
NOT SHOWN	SOFTWARE AEU-7000 MOTOR DRIVER	890021	1
NOT SHOWN	SOFTWARE AEU-7000 MASTER CODE-PORT 1	890022	1
NOT SHOWN	SOFTWARE AEU-7000 SLAVE CODE-PORT 2	890023	1
NOT SHOWN	FOOTSWITCH ON/OFF 4 PIN MALE	AE-7PM	1

Figure 44 - AEU-7000E PARTS



SYMBOL DEFINITIONS:

	Attention, consult accompanying documents		Authorized European Representative
	Type BF Equipment		Standby Switch
	Footswitch		Dangerous Voltage
	Do Not Throw Into Trash		Alternating current
	Manufacturer	IPX1	Protection Against Dripping Water
	Fuse Rating		Protective Earth (Ground)
	Motor Direction	P/S	Preset Step Through
	Torque Step Through		Pump On/Off
	Temperature Limitation		Atmospheric Pressure Limitation
	Humidity Limitation	REF	Part Number
	Sterilize At 132°C (270°F)	SN	Serial Number

TOOLS LIST

The following tools are required to perform maintenance on the AEU-7000L/7000E unit:

1. #1 Phillips Screwdriver
2. #2 Phillips Screwdriver
3. Flat-head Screwdriver (small)
4. 5/64” (2 mm) Allen Wrench
5. 1/8” (4 mm) Allen Wrench
6. 3/16" (5 mm) Wrench
7. 1/4” (7 mm) Wrench
8. 5/16” (8 mm) Wrench
9. 3/4” (20 mm) Open-Ended Wrench
10. 13/16” (21 mm) Open-Ended Wrench
11. Long Nose Pliers with Cutter
12. Motor Rotation Tool (Consult Aseptico for availability - PN: AE-43)
13. Standard Voltmeter/Multimeter (For testing Power PCB)
14. Hi-Pot Tester (For Dielectric Withstand Test.)
15. Firmware Programming Tool (PN: AFP-01) with latest Software:
    - AEU-7000L: PNs 890021, 890048, 890049
    - AEU-7000E: PNs 890021, 890022, 890023
16. Reprogramming Memory Card with latest Software:
    - MC-7000L Card: Software PN 890050
    - MC-7000E Card: Software PN 890033

NOTE: The above hand tools are US standard (non-metric) and can be procured locally. The Hi-Pot Tester used is the Associated Research 7564SA. Alternative testers should have specifications equivalent to the Associated Research Model 7564SA Dielectric Tester/Analyzer. To procure the Reprogramming Memory Card with latest Software, contact Aseptico.

WARRANTY

Aseptico warrants this product against defects in material or workmanship for a period of two (2) years, from date of original invoice. Some handpieces are warranted for one year under the same conditions. Other handpieces and expendable components, such as air turbines and light bulbs, are covered by shorter warranty periods, or have no warranty. Aseptico's sole obligation under product warranty is (at its sole option and discretion) to repair or replace any defective component or product in part or whole. Aseptico shall be the sole arbiter of such action.

In the event of alleged defect under warranty, the purchaser is to notify Aseptico's Customer Service Department promptly. Customer Service will provide instructions, usually directing that the product be returned for service. Shipment to Aseptico and the cost thereof is always the responsibility of the purchaser.

Accidental misuse, inappropriate installation, or failure to perform directed maintenance voids the warranty. Deliberately defacing, modifying, or removing the serial number voids the warranty.

Aseptico does not assume, under this warranty, any risks or liabilities arising from the clinical use of its products, whether or not such use involves coincidental utilization of products manufactured by others.

REPAIRS

Aseptico repairs carry a ninety (90) day limited warranty against defects in material and workmanship. This warranty pertains only to the specific repair. Any new and different defect in materials or workmanship will be treated as a new repair. If the product is not covered under warranty, Aseptico offers Repair Services for a fee.

NOTES

For Further Service And/Or Technical Assistance Contact:

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Woodinville, WA 98072-1548
1-800-426-5913 • 425-487-3157 • Fax: 425-487-2608
Internet: www.aseptico.com • Email: info@aseptico.com

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